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**NEWS IN BRIEF**

**Chess master sets up firm**

THE international chess master David Levy, who last year won his ten-year bet that no chess-playing computer would beat him before August 1978, is to form his own company.

To be called Intelligent Software Ltd, its main aim will be to write software and provide advice for people incorporating microprocessors in logical games.

**Hotel systems**

GRAND Metropolitan Hotels has ordered eight more microprocessor-based hotel systems from Hoskyns, following the successful installation of its first such system at St Ermin's Hotel last September. The systems will handle front-office operations in the group's medium-sized London hotels and are due to be installed by May.

**'Premature' strike**

THE Post Office has predicted that a one-day stoppage by 6,000 members of the Society of Civil and Public Servants last Friday, in support of a regrading and improved pay claim (CW, March 22), will have minimal effect on customers. Describing the action as "premature", a Post Office spokesman said that the SCPS action affected the National Giro Bank office in Bristol and slowed the processing of telephone billing.

**Munich office**

TURNKEY Systems International, best known for its IBM-compatible TP monitor Task/Master, has opened its first office in continental Europe. The new office, in Munich, complements an existing office in London.

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**Bank refutes 'That's Life' direct debit allegations**

ALLEGATIONS made on Esther Rantzen's "That's Life" programme that banks do not check the authorisation of direct debits have been refuted by Lloyds. The incident reported on TV was a "one in 20 million human error" in a system that has a wide range of safeguards and indemnities, a Lloyds Bank spokesman said.

The TV programme featured a Colchester man who had taken out a life insurance policy with Friends Provident Life Assurance, and had arranged for premiums to be paid by standing order. By an oversight, the insurance company sent a direct debit to the man's bank, and by another oversight the bank paid it even though it had no authorisation from the customer.

According to the Lloyds spokesman, the bank's computer checks each direct debit to see whether there has been a previous one from the same company. If there has, it passes it, and if not, it throws it up for manual checking that there has been authorisation. In this instance, the manual check was not performed, owing to human error.

The blunder was compounded when the customer went into his branch to complain, and was told by an inexperienced member of staff, "Oh no, we don't check direct debits."

**Education co-ordinator needed, says SRC**

CENTRAL co-ordination of computing developments in schools and colleges, with the appointment of a programme director, must be established by the Department of Education and Science if the challenge of the microprocessor is to be met. That is the main recommendation of the Science Research Council panel on computing, chaired by Derek Roberts (CW, May 4, 1978), which has just submitted its report.

"It is both unrealistic and wasteful of manpower to expect each and every local education authority to tackle the problem independently," the report asserts. "Furthermore, a piecemeal approach hampers the production and spread of useful software." Thus the report recommends a major national programme run by the DES in which the SRC, local authorities, the Schools Council, the Council for Educational Technology, and the Open University would all be involved.

It also proposes that the SRC should fund the development of easy-to-use, highly reliable software packages for schools, including "much more imaginative problem-solving languages" to simplify the man-machine interface.

The Roberts panel comprised several well-known names in industry and the universities, including Iann Barron of Immos, and Philip Hughes, chairman of Logica. Last year it circulated a wide range of government departments, universities, and business firms to get their views on the relative importance of three areas: education and training, new computer applications, and new computer technology.

The 250 replies received were overwhelmingly of the view that education was the highest priority, pointing to the need to improve computer expertise throughout the education spectrum. New applications were also regarded as important, with main interest focussing on industrial robotics, microprocessor applications, and the man-machine interface.

There was less enthusiasm for new technology, and that came from universities, concentrating on software. As a result, the panel is recommending that the SRC should fund additional research on database utilisation

**Solid state IBM disc from Intel**

INTEL is expected to move into the solid state disc business later this year with a product that will be offered as a direct alternative to IBM's fixed head disc storage.

Storage Technology already offers such a product in the form of the 4305, which uses charge coupled device, CCD, components, but industry sources indicate that the Intel product will use 16K dynamic RAMs.

The product is "likely to be called the IN-365X and will look like the IBM 3350 CPU like one to four IBM 3350/3350 A2 or 2835/2805-2 units.

Capacities will probably go up to a maximum of 64 Megabyte which means that the store will require a fairly bulky cabinet.

But the most crucial question is the cost of the system.

New York stock analysts, Morgan Stanley, recently pointed out in one of its electronics newsletters that very low performance 18K RAMs are now being bought for as little as £2.80 each and that at such low prices they start to make sense as solid state discs. The slowest RAMs still offer access times that are far faster than either fixed head disc or CCD units.

Morgan Stanley sees a much more hopeful future for RAM based solid state discs than CCD based units because CCDs are not much cheaper than RAMs and are plagued by a 100 fold worse "soft" error rate from alpha particles than RAMs (CW, July 6, 1979).

Morgan Stanley pointed out that these shortcomings had persuaded erstwhile CCD suppliers to allocate their resources to other semiconductor areas. Intel itself had dropped out of the CCD business along with its alternative source, National Semiconductor, and Motorola had also given up. It appeared that only Fairchild remained as the one committed CCD supplier.

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**Report on micros for Dol out next month**

THE wide-ranging report on microelectronics and information technology prepared last year by Iann Barron and Ray Currow under a contract from the Department of Industry, is to be published next month.

Prepared under the auspices of the Science Policy Research Unit of Sussex University, the report became something of a political football, with many pressure groups claiming that the Dol was "suppressing" its contents. Among these were the implication that information technology could lead to there being four million unemployed in the UK (CW, October 5, 1978).

In fact, the Dol never made any concerted attempt to suppress the report, though it was understood to be unhappy about some of the conclusions concerning the CSERS.

Originally called Towards an Information Society, it is published from the bookshop called The Future Web, 81a Northcliffe, and it will be published by Francis Pines with a price of £1.95.

**Stock Exchange alters Talisman charges**

CHARGES for the Talisman settlement system, scheduled to go live this week, are to be changed by the Stock Exchange Council in response to protests from members. To further sweeten the Talisman pill, the SE will cut the general service charge it levies on members' revenues from 2% to 1½% from September 1.

A letter was sent to all SE members last week saying that the overall annual Talisman tariff would be reduced from the present £8.9 million to £8.2 million.

The strongest protests following the announcement of the scale of charges for individual bargains early this year were about the "hump" in the middle which made bargains in the £5,000 to £10,000 area disproportionately more costly than smaller or bigger bargains.

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**Briefing TP system launched**

THE powerful teleprocessing system, Systat, developed by Systat for the Digital Equipment Corporation VAX-11-780 (CW, December 21/28, 1978), has now been formally announced by the Leeds-based company. Deliveries to selected sites in the UK will start in the summer and the single user price will be £15,000.

Systat runs under the standard VAX/VMS operating system and provides facilities for the multithreading and simultaneous program development, training and live operation.

**Composing system**

A NEWSPAPER composition system, aimed at medium-sized publications, is being developed by SPL and Coltec Data Systems. Based on a PDP-11 processor and Coltec's VDUs, the software is designed to be able to drive any phototypesetter. The first installation will be at the Lancashire Evening Post in mid-1979, using a Compugraphic Videotext 5.

**Sad times**

FOLLOWING the failure of The Times to resume publication on Tuesday (CW, March 17), attention is now focussed on talks with the craft print union, the NGA, which have taken a turn for the worse after earlier progress. The union turned down a management proposal for a trial period with new technology and is considering a strike. Talks with Natsopa press operators over new working arrangements are also proving difficult.

**European first**

THE first Honeywell Level 66/DPS Multics system to be installed in Europe has been accepted ahead of schedule by the Avon Universities Computing Centre, having passed its Central Computer Agency hardware and software trials last time.

**Key-to-disc order**

KL has placed an order worth £50,000 with the US firm, Digital Development Corp of San Diego, California, for DDC Series 800 head per track disc units. They are to be used with KL Key Edit key-to-disc systems.

**Network head**

HEAD of the new Joint Network Team of the Computer Board and the Research Councils (CW, February 1) is Roland Roemer, formerly with the now superseded Network Unit. The team is based at Rutherford Laboratories, near Oxford.

**Talisman escapes**

DESPITE a fire at the Stock Exchange's Wilson Street computer centre on the Friday afternoon, the Talisman settlement system appears to have performed well during its first week of operation.

**Geoff Cross to be A. B. Dick president and chief executive**

AFTER nearly 18 months of seeking acquisitions for UK company GEC in the US from an office in San Diego, former ICL managing director Geoffrey Cross is to become president and chief executive of A. B. Dick, the Chicago-based office equipment manufacturer acquired by GEC in a £52 million takeover.

The company was acquired by GEC with a view to marrying GEC's computer and communications technology to Dick's office equipment, in order to participate in the looming battle for a substantial share of the office automation market.

Cross has relinquished his post as head of GEC Enterprises, the company involved in seeking potential US acquisitions, but GEC stresses that the quest for acquisitions will continue.

Albert B. Dick III becomes chairman of the Chicago company, and Sir Robert Telford, managing director of GEC-Marconi Electronics, who wooed Dick in partnership with Cross, also joins the board.

Meanwhile the Cross era at ICL is now well and truly over with the imminent departure of the second of the two lieutenants most closely associated with Cross, Ed Mack. The resignations were widely expected once Cross left, and stricter tax regulations affecting Americans working abroad, coupled with a feeling that his work on the 2800 series development was essentially complete, are thought to have contributed to Mack's decision to return to the US. He is on holiday at present and not available for comment.



Cross

**More options for ICL users**

COUNTERING repeated criticism of its online processing philosophy, ICL has hit back with a strategic series of software announcements designed to show that it can now meet any transaction processing requirement from within its own product range.

The software announced covers the complete range from entry level 2003/4 applications up to large 2800-based systems running under VME/B and includes new or enhanced products in all market sectors.

For its top-end users, ICL has introduced an extended version of its VME/B software TP Option. To be known as TPMS, this will run both under B and under K from release KSV17 onwards and will be available from the middle of the year.

At the bottom end, the company has broken decisively with its partner of the last 18 months, Telecomputing, and will instead be marketing TPE, a 2903/4 entry level package developed by Transaction Processing Systems.

**Digico may offer alternative to 370X front end processor**

IBM users may soon be offered an alternative to the 370X front end processor by Digico, a firm already well established as a supplier of FEPs to ICL 1800 users.

Digico says it is seriously looking at the IBM market and sees a need for a FEP that would be user programmable and could carry out full data validation and file updating, relieving the host of some of these functions.

Digico has already taken an important step in the direction of IBM front ending with a HASP workstation based on its 18E computer. The system provides the unusual additional facility of operating concurrently as a disc based multiprogramming local processor that can be programmed in Basic.

The first installation has been made by Digico's Danish agent at Kedo, a furniture manufacturer in Copenhagen. The configuration includes five VDUs and 11 Megabytes of disc storage for local processing as well as a 600 lpm printer and a 400 cpm card reader for HASP communications with a remote 370/168.

**COMPUTER WEEKLY'S INSIDE NEWS**

THE TRAINING GAP	Why is there still such an enormous gap between the theoretical and the practical? Jonathan Hamilton believes the answer is the lack of effective training, and he offers some ideas that could see the situation improved. Page 4
FIRST OF THE STARS	Computers 78 is under way. Report and pictures of some of the highlights. Page 14/15
PANDORA'S TP BOX	The growth of teleprocessing has opened up a Pandora's box, but it has given us a host of new opportunities. Report on the possibilities of teleprocessing. Page 22
INDIAN PALMER	This year's EEC mission to India went to study the hardware scene and the prospects for collaboration with European companies. First of a series of reports on the tour. Page 23
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**Politics costs Univac two orders**

WITHIN days of losing out to CII-Honeywell Bull on the contract for a message switching system for the Soviet Union, Univac has lost a second contract to the French company, this time from a steel company. In each case, the decision was purely political.

The steel company, Solmer, has recently come under French state control as part of a restructuring of the French steel industry. Prior to this it had awarded Univac a 30 million franc contract for a large-scale dual processor 1100/82 system.

After four months of pressure from the French Industry Ministry, Solmer has now been persuaded to change its mind, cancel the 1100 contract and instead take a multi-processor Level 66/DPS-3 machine from CII-HB. Although final assembly and test of Level 66 machines is just beginning in France, it is expected that the machine from Solmer will come from Honeywell's Phoenix, Arizona, plant.

Univac is to get compensation of \$1.2 million for the broken contract, and this is expected to be paid out of government funds allocated for support of the French computer industry.

Because of the Easter holiday, nobody could be contacted at Solmer, but it is understood that the company has two CII Iris 80s, so conversion would be involved either way.

Although President Carter last week reversed his previous decision to embargo a Univac 1100 system wanted by the Russian news agency, Tass, for message switching in connection with the 1980 Olympics (CW, April 12), it is almost certain that his decision came too late to save the order and that it will go to CII-HB, this time with an Iris 80.

A spokesman for Univac in Bluebell, Pennsylvania, told Computer Weekly that the company was still hopeful of getting the business, but CII-HB is understood to have a firm contract.

Export of either machine to Russia will still have to go through the CoCom approval process, and Univac has submitted its proposal for approval.

**Euronet on agenda**

EURONET will be the subject of the BCS data communications specialist group's meeting next Monday, April 27, at the BCS headquarters, 13 Mansfield Street, London, starting at 6pm. The speaker is to be Phil Kelly, the Post Office director of network planning.

**Videofiche document processing takes off**

ELECTRONIC document processing looks like getting off the ground in a big way now that the first installations are being made of the Videofiche system, one of the star turns at last year's Sceb exhibition in Paris (CW, September 28, 1978).

Videofiche was developed by Correlative Systems International of Brussels, which has just set up a UK subsidiary based in Birmingham called Cor/Sys. The firm is now talking to three of the major UK clearing banks about Videofiche, as well as the BBC, British Airways and several building societies.

Videofiche could turn out to be a hot competitor for the cheque scanning and transmission systems currently being developed by Burroughs for the Midland Bank (CW, March 1), and by NCR in the US for the Bank of America (CW, March 1).

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## Downtime

by Chad

### Less than equal

AT the Info 79 exhibition, Christine Stott of Case, the telecommunications manufacturer, was proudly showing off her first all-girl stand, that is, the first manned, er, personned, entirely by women. Most scathing she was of the men visitors who strode onto the stand and said, "Can I speak to someone who knows about this equipment?"

"Certainly sir," Christine would reply in her best icicle manner. "Would you like to talk to me, or perhaps our engineer?" pointing to Liz Rees.

I meekly suggested that perhaps the men's assumptions stemmed not from misogyny but from experience. On each of the two previous stands I had visited I had asked the woman de-

monstrator a fairly basic technical question. The first gave me an answer that was flatly wrong and the second said she would have to get an engineer to phone me.

This Christine greeted with her famous duplex smile that is both disarming and withering at the same time. Anyway, more power to her elbow. I say, the sooner people like her and her team convince more women to take an interest in matters technical, the quicker the problem will disappear.

With superb timing, the head of a Case salesperson (male) who had dropped in on the stand poked out of a back room. "Would you like milk in your tea, Christine?" he asked.

### Eccentric nosedive

OH dear, I've got some grovelling to do. My piece on April 5 claiming that an airliner could not have an offset nosewheel turns out to be a load of cobblers. My aviation correspondent assures me that Trident does indeed have such a nose-wheel, and that although when the brakes are on, the asymmetry does produce an effect tending to skew the plane round, this is so slight that the pilot can easily compensate for it with his steering. My apologies to our artist

and to late aircraft buffs. The explanations I was given for why the wheel is offset are interesting though. Some said the strut has to fold up sideways to clear the luggage bay. Others said that the automatic landing system is so accurate that were the wheel in the middle, it would bump up and down on the centre lights of the runway. Aeroplanes are so much more romantic than computers, aren't they? They even have their own oral mythology, with opposing camps.

## We must see to it that programmers are trained in their craft

IN a supplement last year on education and training, none of the contributors asked why the shortfall of programmers was so large, though one did comment on the fact that at the time there were over a million unemployed.

There are, I believe, two main reasons for this shortfall, one of which is not hard to find — the industry is growing at a far faster rate than the educational system, and too fast for management to invest in expensive training. We need programmers now!

Other commentators have suggested that training is expensive and inappropriate, and though the government's Tops and Threshold schemes avoid this, we are faced with its comparative ineffectiveness. Surely, we are totally underestimating the size of the problem?

Perhaps we have the wrong approach. Enough has been written about the inappropriateness of computer science degrees to the needs of the data processing industry to lead one to ask: what are we trying to do? Is programming really a profession? Do we expect programmers to study for six years, like doctors and architects, before being let loose?

Do we expect them to practise for five years before granting professional status, like engineers? It really does matter how we think of programming.

Is it an art, to be practised by those with a gift for it? Is it a science, or a craft? Does it really make sense to send someone on a six-week "programming course" and then expect productive work?

When we see what kind of activity programming is, then we can be clear about the form training should take. Not all readers are or have been programmers. Just why have

we not seen the user's point of view?

And what about management skills such as project leadership? If this were not enough, he must keep up-to-date, be willing to rise above a deluge of manuals, amendments, software notices and errors, and new issues of operating systems and other software.

Do we really expect program-

mers to learn all this in 40 weeks?

Many people when asked who should do the training say in essence "not me": the government, the NCC, or the BCS, or a "body". Before we can decide on who, what do we require of programming training?

First, it should be up-to-date. This, if they are to train, is a sizeable problem and the government is aware of this.

Second, it should be thorough: a course to teach a programming language is not a programming course.

Third, it should be productive: that is, trainees should contribute materially right from the start. Who knows best the day-to-day requirements of the job?

Fourth, it should be "tailored" to suit the company and the individual, so mass programming courses will not do.

Fifth, it must be economic. It must be fitted that no part of the industry is expendable. I do not think that the "ever escalating salary levels" mentioned by D. J. Cowtan, (CW, November 30, 1978) are an admirable objective.

The current situation is deplorable: not every programmer has the ability to be a DP manager, but we are getting to the point where many programmers are paid more than DPMs with

### By Jonathan Hamilton

The shortage of programmers must be tackled. JONATHAN HAMILTON, one of the team at the South West Universities Regional Computer Centre implementing the RSRE portable computer for the Avon Universities Honeywell Multics system, argues that programming is a craft, and that everyone in the industry must tackle the problem of training.

training schemes failed to provide anything like the number of programmers needed?

A practising programmer is concerned with documents, programs, computers and users (not necessarily in this order). He must be able to understand specifications, and create and maintain them; to discern gaps in specifications and be able to ask the right questions to fill them.

All this betokens a certain familiarity and appreciation of systems — their functions and documentation.

He must understand the function of a program, its position within a system and relative importance, the trade-offs of timing versus efficiency; how much time to write efficient code; will inefficient coding grossly affect the program run (as it run daily, weekly, yearly)?

He must be cognisant of programming methodologies, their appropriateness to the job, their ease of use or otherwise.

He should be able to code to specified standards, understanding and using layout and character conventions, and knowing something of data preparation.

He should know how to generate test data — whether to use test data generators — and how much.

He should know how to dry-run or desk-check a program, how to run his program on a computer, the ins-and-outs of debugging — this last alone demands familiarity with the programming language and the facilities of the interpreter/compiler.

He should be familiar with the available software: with program development aids such as flow-charts, decision table preprocessors, and cross-reference generators; with utilities such as consolidators, loaders, library manipulation programs, aort; backing store maintenance and file handlers.

He should know the contents and specifications of subroutine libraries, be familiar with the more common packages for his particular computer, such as the National Computing Centre's Filetab — another language.

He should know his computer! He should be able to exploit the hardware dependence of his chosen programming language(s) where expedient; be familiar with the operating system, with the job control language — yes, yet another language — most programmers are multi-lingual.

He should be able to write macros, manage files, submit jobs, liaise with operators, understand the difference between production and development environments, priorities, scheduling and timing.

He should know what a program looks like from the operator's point of view, and

what kind of training can reasonably be expected from these places? Training establishments are perhaps best fitted to provide extended courses — programming languages, operating systems, special techniques or methodologies, or specialist courses on aspects of computer science.

Training departments can provide the necessary bubble appreciation courses, or even computer appreciation courses. Above all, any recruits to using a computer should have computer appreciation. Above all, any recruits to using a computer should have computer appreciation.

Yes, we must all bear the brunt of training. The scholar has not in their hands, as you say.

The other reason for shortfall of programmers is now he apparent — programming is a craft, and as such requires a five-year apprenticeship in common with other crafts. Our failure to appreciate this has led to the introduction of irrelevant training.

Programming regarded as a craft, makes sense. No one expects a mason or a carpenter to be proficient in 40 weeks, or even two years.

The approach is simple: a complete equivalence for a government training scheme and in common with apprenticeship, two years for graduate (three for post-graduate). But we should expect every apprentice to serve at least two years in the industry.

## Lessors seeking EEC help over IBM's prices

IBM may soon have no excuse for withholding its rental and lease prices from European leasing companies if the EEC responds to a request from the European Computer Leasing and Trading Association, ECLAT.

IBM insists that it would be the violating articles 75 and 76 of the Treaty of Rome if it revealed its prices to third party lessors because this would be interpreted as collusion, and therefore, anti-competitive. It could also prejudice IBM's position with regard to the EEC investigations into its practices, that have been

going on for several years. But Parry Mitchell, president of ECLAT, told Computer Weekly, "I have been to Brussels and the directorate has indicated that IBM would not be prejudicing its position if it revealed its prices to us."

"It has now formally written to the director-general of restrictive practices asking for the directorate's view to be put in writing. I think there is a 50/50 chance they will respond."

Mitchell pointed out that the US government takes the

opposite view to the EEC on prices. While the EEC regards the exchanging of prices between companies as anti-competitive collusion, the withholding of prices in the US is seen as monopolistic and a restriction on competition. The US Justice Department insists that IBM publishes its prices.

However, IBM in Europe looks like making a major concession to ECLAT by providing ECLAT members with the invaluable consultants handbook that is published by IBM in the US and which comprises about 4,000 loose leaf pages in four volumes crammed with detailed information on just about every IBM hardware and software product.

The handbook also includes all IBM's US prices, but these are of little value to third party lessors in Europe.

Mitchell explained, "At the moment we have to ask a potential customer what prices IBM has quoted to him before

we can decide on our own prices."

IBM's European manager for industry relations, Peter Owden, told an ECLAT meeting in Paris earlier this month that IBM wanted to make the consultants handbook available to ECLAT members, but at the same time he reaffirmed IBM's European policy of not revealing its prices.

### Encore for micro forum

MOTOROLA's highly successful Microcomputer Forum, which last year packed the Institution of Electrical Engineers lecture theatre to overflowing is to be held again, at the same venue, on June 4. Among the attractions will be Tom Gunter, Motorola's manager of advanced computer systems, who will speak about the 68000, 16-bit microprocessor and its peripheral devices.

## Canada makes freedom of information a major election issue

FREEDOM of Information has become a major issue in the Canadian General Election, in which polling takes place on May 22. Joe Clark, leader of the opposition Progressive Conservative Party, called for a Freedom of Information Act in one of his first speeches of the campaign.

The ruling Liberal Party had promised to introduce a Bill in Parliament by the end of March, but the election had been called before it did so.

In anticipation of the Liberals' proposals, which it was felt would be half-hearted, the Canadian Bar Association has drawn up a model Bill incorporating several novel features. Most notable of these is the requirement that the Information Act would take precedence over all other existing Acts that require information to be kept secret. No documents could be withheld any longer except those in the exempt categories specified in the new Act.

In the six exempt categories, there is no mention of "national security," a term which the Canadian jurists thought too all-encompassing. Instead, "national defence" and "international relations" are exempted, together with "law enforcement" and "legal proceedings." The latter category is specified in some detail, however, keeping secret such documents as might endanger the life of a law enforcement officer, interfere with enforcement proceedings, and so on.

Specifically not exempted, though, is information indicating that the police have exceeded their powers or followed illegal law enforcement procedures. This provision could be particularly tricky to implement.

In another area, the Canadian proposals exempt "policy advice," namely opinions, advice and recommendations put forward by officials.

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A NEW "expert system" is exciting interest among US mining and prospecting corporations, as well as in US government agencies concerned with the energy problem and with exploitation of natural resources.

SRI International's Prospector program gives intelligent advice, at a cost of about \$10 per consultation, on geological sites for drilling.

In a Privateview (CW March 22) I pointed out that knowledge-based systems mark a break with past computing history by adding two new user modes to the traditional executive mode.

In execute mode the user poses problems and the system computes solutions.

In the new modes, which are essentially "edit" modes, the user acts as teacher, augmenting the system's store of facts, patterns, and inference rules; or he acts as learner, rummaging interactively in the system's knowledge-base in order to augment his own expertise in the topic area.

Typically, the execute-mode user and the teacher-learner users are different people. The person seeking solutions from Prospector is likely to be an executive of a mining com-

# MICHIE'S PRIVATEVIEW

## Making a break with past

pany. The teacher-user is likely to be an economic geologist hired by the company to build, validate and tune Prospector's base of useful knowledge. The learner-user may be the same specialist, or another geologist interested in picking up some of the first geologist's specialist knowledge in machine-refined form.

Interaction in teacher-learner mode between a domain specialist and an expert system entails of necessity that the dialogue be conducted at the same conceptual level as that to which the human specialist is intellectually accustomed.

This in turn imposes a profound and far-reaching requirement on the structures used to represent specialist knowledge.

They must embody descriptions of the domain corresponding closely to the human's own mental descriptions.

Otherwise both teacher mode and learner mode become impossible.

A representation of a complex domain, which gives high execute mode efficiency, scores a success in terms of traditional computing. If, however, its problem-representations fall outside the "human window", then, as an expert system, it is a non-starter.

Such a program may not anyway have been intended for teacher-learner use. Then there is no discredit. Don Beal of Queen Mary College, London, has accomplished a tour-de-force in the form of a program which assigns to any "king and pawn versus king" chess position the correct diagnosis "won" or "drawn" (if you think that is easy to program, try it).

His chosen representation is a decision-table driven by some 50-odd patterns. This,

however, sub-divides the domain into a larger number of smaller conceptual slices than the chess expert's brain does when encoding the same task.

The result is that, although the program performs the task with exceptional efficiency, inspection of its internal representation leaves the chess expert mentally in the dark.

To him it is all gobbledygook, which he can neither augment, criticise nor revise, nor can he draw any chess wisdom from it.

Max Brammer, on the other hand, working at the Open University, has developed a representation using just 19 patterns. These correspond closely to the chess-master's own descriptive concepts.

Hence although its execute mode is relatively inefficient, its teacher-learner mode is superlative — an "expert system" in miniature.

What kind of language

should mediate the teacher-learner mode? Some projects have developed special knowledge-representation, or "advice", languages. The school of thought sees English as the ultimate desideratum.

Certainly in the commercial world of large databases, which have certain aspects and problems in common with expert systems, impressive beginnings have been made.

A US Defence Department clerk types: "What US ships are within 200 miles of Naples?" The screen lights up with: "The Fox and the Philadelphia."

"Show them to me," the clerk types.

On the screen appears a map of the Mediterranean, with glowing dots representing the locations of the ships.

Interaction here is with Lifer, developed for the US Navy as a combined operation of Gio Wiederhold's university project studying large databases and Earl Sacerdoti's artificial intelligence group at SRI International, formerly Stanford Research International.

More generally available is Larry Harris' Robot system, now marketed by Artificial Intelligence Corp in Bethesda, US. Business users type such queries as: "Print me a report on the 1975 performance of regional sales from region and gross profit," or "What is the greatest salary paid to any girl machinist in the carpet department at the Louisville branch?"

In my own trials of Robot I have formed the opinion that it



is fairly easy to confuse it that is what you set yourself. But if you intend to do database-interrogation on a practical basis, then its responses are helpful and to the point.

If it falls fully to understand your query, it immediately indicates what further hint or clarification will enable it to answer you.

Realistic costs are a few dollars per query. Calculation of comparative costs of conventional systems leads to the following guesstimates:

- OLD WAY (programmer-hours per query) 60 dollars.
- CONVENTIONAL DBMS (45 minutes per query) 20 dollars.

Many roads lead towards enhancement of program productivity. Most of them have an automatic programming orientation of one sort or another. All Robot seems to be among these worth noting.

REFERENCES

Hart, J. E., Duda, R. O., Uehara, M. T. (1978) A computer-based consultation system for mineral exploration. SRI International, 333 Ravenswood Avenue, Menlo Park, California, 94025, USA.

Robot Technical Papers (1978) AIC, 1420 Montgomery Lane, Bethesda, Maryland, USA.

## SOFTWARE FILE

# Telecomputing's entry level TP

HAVING won a worldwide user base of over 200 for its ICL teleprocessing monitor TPS, Telecomputing has now launched a TPS subset system under the name TPS-impact.

TPS-impact takes its name from its intended cases where an ICL TP system must be implemented quickly. It differs from TPS not in the facilities provided but rather in the number of processing options.

In the area of warm restart, for example, it supports just one recovery method, re-processing the message log. The number of message types is also reduced

together with the amount of Cobol application code permissible for each message.

It is thus considerably less complex than the full TPS system while offering total upward compatibility.

The package, which runs with or without MTS on a 2803/4, also includes as standard one of the latest chargeable TPS options, Interactive Development System (IDS). Formerly known as Interactive Operator (Software File, October 13, 1977), this provides a complete environment for online program development.

Emphasising its status as an

TELECOMPUTING's move into the entry level market closely parallels a similar step taken last year by Zeuss-Hormas, which introduced a low-cost TP package called Cadix to complement its full-scale monitor Cortex (Software File, February 23, 1978).

Latest customer for the enhanced Cortex, Cortex-Plus, is France's largest bank, Credit Agricole. To be run initially on an ICL 1903T — one the bank's seven ICL computers — the software will probably be used eventually on two recently ordered 2800s.

entry level system, TPS-impact, at £4,970, is priced at not much more than IDS itself, currently sold for £2,850.

Further, those buying the package will be credited by Telecomputing with the full purchase price should they subsequently migrate to full TPS.

TPS-impact is not covered by the company's worldwide marketing agreement with ICL in respect of TPS itself and will be marketed only by Telecomputing.

## Block size possibilities

MORE details have now become available on CA-Dynam/FI, the Computer Associates package that provides DOS/VS users with file independence and was launched in the US earlier this year (CW, February 1).

Key feature of the package is that it enables the block size of a sequential file to be altered without any modification to user programs. The new file may either be re-blocked according to JCL specifications or may have its block size optimised automatically according to the device type.

At the same time, the software will dynamically allocate either single or double buffering for the file defined.

Dynam/FI also offers support for Vsam, allowing records to be allocated to or retrieved from a Vsam file even when a non-Vsam file is defined in the program.

All the facilities are backed up with a file attribute catalogue; an audit trail option; and a report generator program that documents Dynam/FI file processing activity.



# SPL names head of new database group

TO complement its other software and consultancy activities, SPL has set up a specialist database group within the company, of which Jim Hackett (left) will be the first manager.

Hackett, internationally known for his work on large database and management information systems, was a founder member of Scicon's database group and had overall responsibility for the introduction of IDMS to the UK.

In recent years he has been a freelance database consultant and has worked closely both with Cullinane and major DBMS user companies.

## Certification service now a step nearer

WITH the issue of standards once more of vital importance to users, discussions are under way between the National Physical Laboratory and the CCA which could lead to the establishment of a UK software certification service.

The NPL has offered to devote its technical expertise in software validation and verification to such a service, and will meet the CCA for a second time early in May. Other parties likely to be involved in these discussions include the NCC, the BSI and the National Computer Users Forum.

The NPL is understood to have singled out two key areas for its contribution. One is in checking-out high level proto-

cols, possibly including manufacturers' networking software, and the second is in validating high-level language compilers.

A compiler validation service has been in operation for some years in the US. Originally concerned particularly with Cobol, the service has latterly taken in Fortran too, and in both cases aims to verify strict conformance to ANSI language standards.

Little similar work has yet been undertaken in the UK, a notable exception being that of RSRE in the field of Coral GK.

The NCUF is to present a report, "The status of standards in computing", to the EEC in May (CW, March 15).

## PROGRAMMER NOTES

# Role of Cobol program generators in productivity

ONE field in which the 1980s are likely to bring major developments is Cobol program generators.

Such software, which creates Cobol source code from high level program specifications, represents one obvious line of attack on the crucial problem of programmer productivity — highlighted two weeks ago in Programmer Notes as a vital industry issue for the forthcoming years (CW, April 5).

Because of its relatively rigid format, Cobol is particularly susceptible to generative techniques and has already attracted a number of interesting developments in this direction.

At the bottom end of this range are the various pre-processors which accept shorthand Cobol. Overlapping with these, yet offering a considerable extension of function, are such systems as ADR's Meta-Cobol and JSP-Cobol, which creates a Procedura Division from Michael Jackson's pro-

gram design language (Software File, November 9, 1978).

The top end of the range is formed by systems which can produce a complete Cobol program from relatively simple high level input. One example of these is the Cobol generator provided by Wang on its 2200 VS machines (Software File, July 13, 1978).

Another similar system has now come to light in the form of a generator linked to Systematics, the systems analysis method developed by Kit Grindley of Urwick Dynamics and first publicised some four years ago.

An extremely appealing methodology, Systematics is based on a simple two-dimensional grid of data set dictionaries. These define system input and output information in some detail and act both as system specification and documentation.

What has now been developed is a two-stage Cobol program

generator which takes as its prime input Systematics' program and system specifications.

As described by Kit Grindley at a BCS Cobol meeting last month, the first stage takes this input and produces a parameter file, typically containing some 300-400 items. These are then used in the second stage to customise a general purpose processing program.

The output from this phase is a tailored Cobol source program.

One of the most attractive aspects of this system is that it can produce a "prototype" program very quickly, even from an incomplete specification. The program can subsequently be tuned to the exact user requirement, by gradually hardening up the specification.

This style of development is based on the thesis that mistakes are inevitable in any complex processing system, and that many will not become evident until the user sees the first output.

With the generator, first versions of the application software can be produced within a day, thereafter entering what is in effect a maintenance phase.

The system of course depends critically on the proforma programs, which Grindley refers to as "prime code." This currently exists for three common applications, namely batch processing data sets; batch processing updates; and a print program.

The prime code for these applications, says Grindley, solves the cases once and for all in a general way, and is customised by the generator using techniques similar to word-processing.

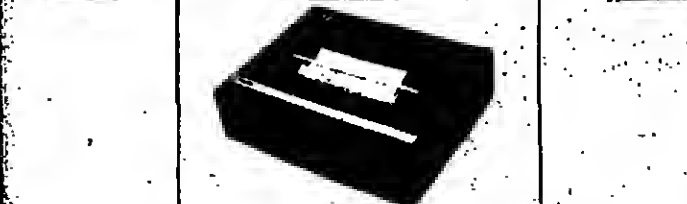
Urwick Dynamics has so far implemented three systems using the generator, which it describes as a "package for producing packages." The software, though, is not yet commercially available except on a trial basis.

With growing concern over productivity and a continuing severe shortage of programmers, it seems likely that such systems may play an increasingly large role in the future of commercial computing.

They could also do much to relieve the programmer of what are after all highly repetitive tasks.

Programmer Notes would always be delighted to hear from those with dissenting or countervailing views or those with either good or bad experience of such software.

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# ESA in timesharing link with Atkins

THE intricacies of RCA's cost-estimating package Price appear to have been a major factor in winning Atkins On-Line a time sharing contract with Essee, the European Space Agency's technical centre based in The Hague. Essee will use the software via an Atkins node in The Hague and intends to use the Price system to estimate costs in its satellite development and production programmes. It will also use the package to assist in the evaluation of contractors' bids.

Price, described as a turnkey cost-estimating modelling system, was originally developed for the aerospace industry and is owned by RCA.

It has been actively marketed by RCA in the US with considerable success. Included among over 80 major users are Naso, General Electric, Motorola, Goodyear, and Lockheed, together with all the US defence procurement agencies.

## Assessing Masoot

CAPS Reading office is to develop a set of assessment procedures for Masoot software under a contract from RSRE. The work follows proposals that Masoot should be adopted as a MoD standard in the same way as Coral, for which RSRE has in the past developed validation procedures and compiler benchmarking tests.

## Medical contract

SOFTWARE Sciences Belgium has been awarded a major contract by the US medical equipment company Baxter Travenol to develop a European-wide materials management system.

An interesting aspect of the system, which is run interactively, is that it offers three complementary modes of operation. In normal mode, costs are computed directly from user input. The model can also be run in reverse, calculating "unphysical factors" from known project costs; this is designed particularly to allow model calibration.

In the third mode, Design-Cost, specified costs are used to compute typical program costs and project schedules. This allows Price to be applied to investigation of project feasibility and to the establishment of "scope-out goals".

## Puzzler

THE Americans are keen on politics, and take their presidential elections in particular very seriously. All prospective candidates before the household names, and some are even "Immortals" with a capital "I". For example, recently years ago seeing the slogan:

ATTY A BOY LYNDON B JOHNSON

In a US periodical, these two multiple sums are completely worked out and have different algebraic solutions. The puzzle is: what does the word "BOY" mean in the same context as the word "JOHNSON"?

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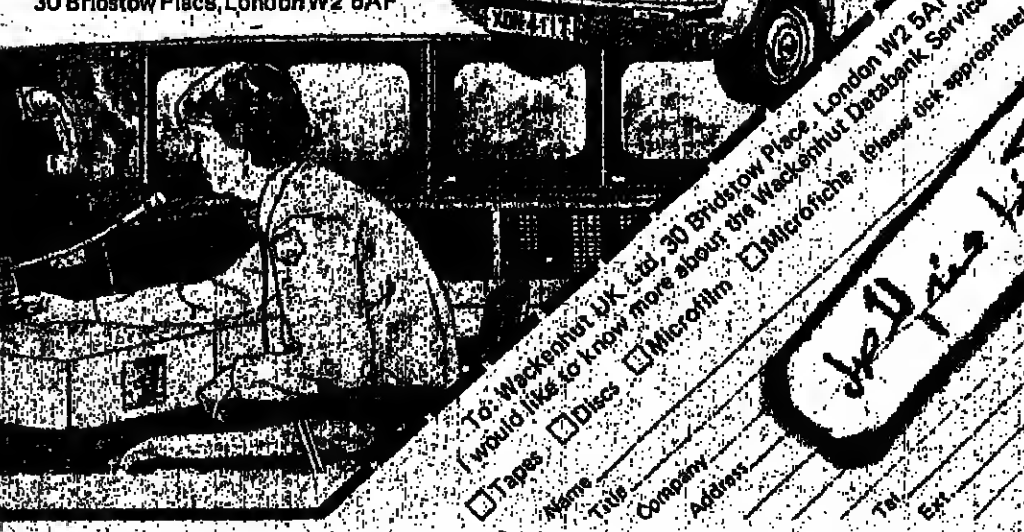
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## OP SPOT

### HINT OF THE WEEK

## Study the hardcopy log

THE hardcopy log is a mine of information for the trainee operator wishing to learn more about the operating system and the workload.

Study it to learn more about the messages issued by the operating system and to see how the various operating commands are used. Use it to find out the order in which the large job suites are run. It is particularly useful at installations where the documentation is not of a very high standard.

Op Spot awaits your hints. Remember, they can be technical or general in content as long as they relate to the operations environment. And we will give £5 for each one published.

Please include the name and address of your company and a telephone number on which you may be contacted during the daytime.

# Out on his own—straight from a TOPS course to solo running

By Bernard Allen

THINGS are looking good for ex-TOPS student Dave Townsend as he approaches his fourth month as a junior operator at the First National Bank of Chicago's site in Whitehall, London.

He is enjoying the work, obviously coming to terms with the demands of the department very quickly, and is settling well in London, having re-located from Chipping Norton in Oxfordshire.

"Yes, I'm very pleased with the way things have gone so far," said David, who met me in London the other week to discuss his progress.

Working as the junior partner of a two-man shift team, he is involved in the running of two IBM System 36, providing an online service to staff in the bank's London and Dublin branches.

The terminals are used by



Dave Townsend

the secretaries who do the "wheeling and dealing" on the Foreign Exchange.

"With all the money that gets moved about, I reckon the capitalist system would probably fall down now if we didn't have computers," he said.

Being part of a small team has

Bernard Allen interviewed Dave Townsend both in the middle and at the end of the TOPS operations course at Sorehamwood College in Herts. David has been working as a junior operator at the First National Bank of Chicago in London for nearly four months, and in this interview he talks of his experience and impressions of the industry so far.

Steve Ward, another of the TOPS operations students Bernard met at Sorehamwood College, is now employed at the Edwards, North London, site of the Bankers Automated Clearing Services. Bernard hopes to see Steve at a later date in order to find out how he is progressing in the industry.



Steve Ward

enabled him to acquire considerable practical operations experience early in his career.

Not for David the two months or so operating printers which new recruits at very large installations sometimes have to put up with.

He said, "As you know, when I was a TOPS student I did my practical training at the bank's site—that's how I got offered the job—and I learned a lot from that."

"I have just gone on building on what I learned during my visit as a TOPS student. When I joined the bank I already knew, for example, how to IPL the System 3."

For David, a day in operations now involves running a system without direct supervision. If he comes up against a problem he is

unable to cope with, he calls upon the experience of his senior operator.

He works a two-shift rota for which he receives an allowance of £680 a year.

"Although I don't mind working evenings, I prefer the day shift as it doesn't interfere with social life," he said.

Day shift is from 7.30 am till 3 pm. He went on: "We start up both machines at 7.30 am and run housekeeping on them until 9 o'clock. The schedule for each system is different."

On the so-called London machine, users are brought online under CCP, the Customer Control Program.

He continued: "We sometimes get users calling us up at about 9.30, complaining that CCP hasn't been started. In most cases they can't get into the system because their terminals weren't switched on early enough."

In-house programmers have been testing on the other system from 9 am till 1 o'clock. After that CCP is started for the bank's Dublin branch.

As regards his dealings with programmers, he said, "I get on quite well with all of them, but prefer those who have operational experience."

"You can always tell the experienced operator, because he will say 'Can you please run this job for me?' whereas the programmer with no operational experience will say, 'You must run this job for me.' It's obvious which one appreciates our problems."

The evening shift involves a lot of batch work and calls for the operators to meet strict deadlines.

Said David, "CCP comes off the London machine at 5.30

sharp. From then till 1 o'clock in the morning we run live batch work to produce lots of reports and statements, which are taken by despatch rider to our London branch."

Dublin staff have CCP (2) pm. As on the London system, batch jobs are run to produce reports, statements and various other output.

He said: "All the output for the Dublin office must be finished and boxed-up by 8.30 sharp. It is then collected for transportation to Dublin by the Post Office Datapost service."

"I prefer operating the London machine on the evening shift as it provides the chance to do some overtime."

The size of the two system means that the operators don't have a lot of peripheral work to do, aside from feeding cards to the readers, that is.

David had a few comments to make about those devices. He said, "Feeding cards to the reader can be a bit of a bug because we tend to get rather a lot of read/compare errors on our 1442 reader devices."

"Every time that happens, you have to take two cards out of the device and feed them back. The large batch jobs seem to take ages."

"And IBM don't help much either—the engineer always seems to take ages in arriving, and the units don't seem to work much better after he's been working on them."

But the operators' task will ease some time in the future because the bank plans to replace the card readers with floppy disc readers, which are already on site.

Their task will be further eased when a project to install printers at the Dublin office is

completed. Then they won't have to meet the 8.30 deadline every evening.

So far all of David's training has taken place in the computer room, but plans are in hand for him to visit users' departments to get a better appreciation of their needs and problems.

"It's intended to broaden my knowledge of the way the bank functions," he said.

On a more personal level, David is looking to buy a house somewhere in London.

"After you have been at the bank for a year, they will give you a 5% mortgage. But I won't wait till then. I hope to get a place as soon as I've sold my house in Oxford."

OPERATORS often complain that nobody listens to their point of view. What do you think? Would you like to have your opinion taken into account? If so, please write to: Bernard Allen, Op Spot, Computer Weekly, Digital House, Richmond Street, London, SE1 1 1. Telephone: 01-833 8877. Telex: 915 455.

## Visits to service bureau

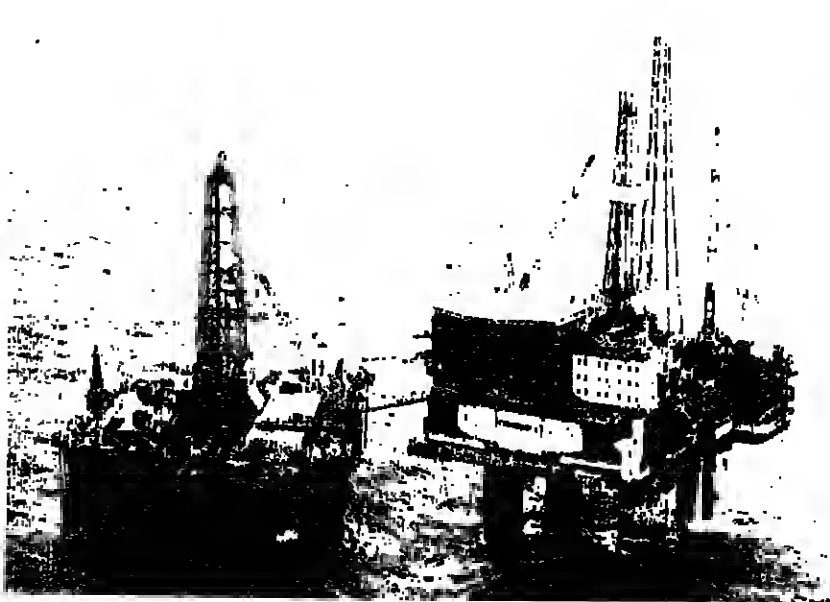
I HAVE had a good response to my request for installations to feature in Op Spot. The first visit will be to Austral Computer Services, a bureau in the City of London.

## Monitoring oil rig behaviour

A FAMILIAR sight in the North Sea these days is all production and drilling platforms like Cormorant A and Norrhol, shown here. They belong to Shell (UK) Exploration and Production which has placed a £100,000 contract with Structural Dynamics for a base line measurement survey that will cover the recording and analysis of the vibratory behaviour of 100 pieces of rotating machinery on Cormorant A and two other platforms.

The essence of base line measurement is that it assesses how a piece of equipment performs at the start of its life and produces profiles against which future behaviour can be compared.

Data will be recorded on magnetic tape and taken to the office of Structural Dynamics in Southampton where it will be processed on the company's Prime 400 computer.



## Ministers quizzed on medical research

THE subject of the development for medical diagnosis of nuclear magnetic resonance, a technique which uses radio waves to define the structure of complex chemicals, has been raised in the Commons by Mrs Renée Short.

The technique is used to produce cross-sectional images of the human body, including any abnormalities in the tissues, by linking NMR instruments to a computer which reconstructs the slices. NMR will, it is hoped, provide a complementary or even a substitute technique to CAT scanning, without the risk which accompanies the use of X-rays.

Mrs Short asked the Secretary of State for Industry and for Social Services what help they were giving research into the technology, and how they intended to assist its commercial exploitation by UK firms.

Alan Williams, Industry Minister, replied that the DoI aid would be available for projects which held commercial promise. Support was being given from public funds to research groups at several universities, and through government agencies to research by industry.

Health Minister Roland Moyle replied that his department was working closely with the NRDC to assist in the development of the technology.

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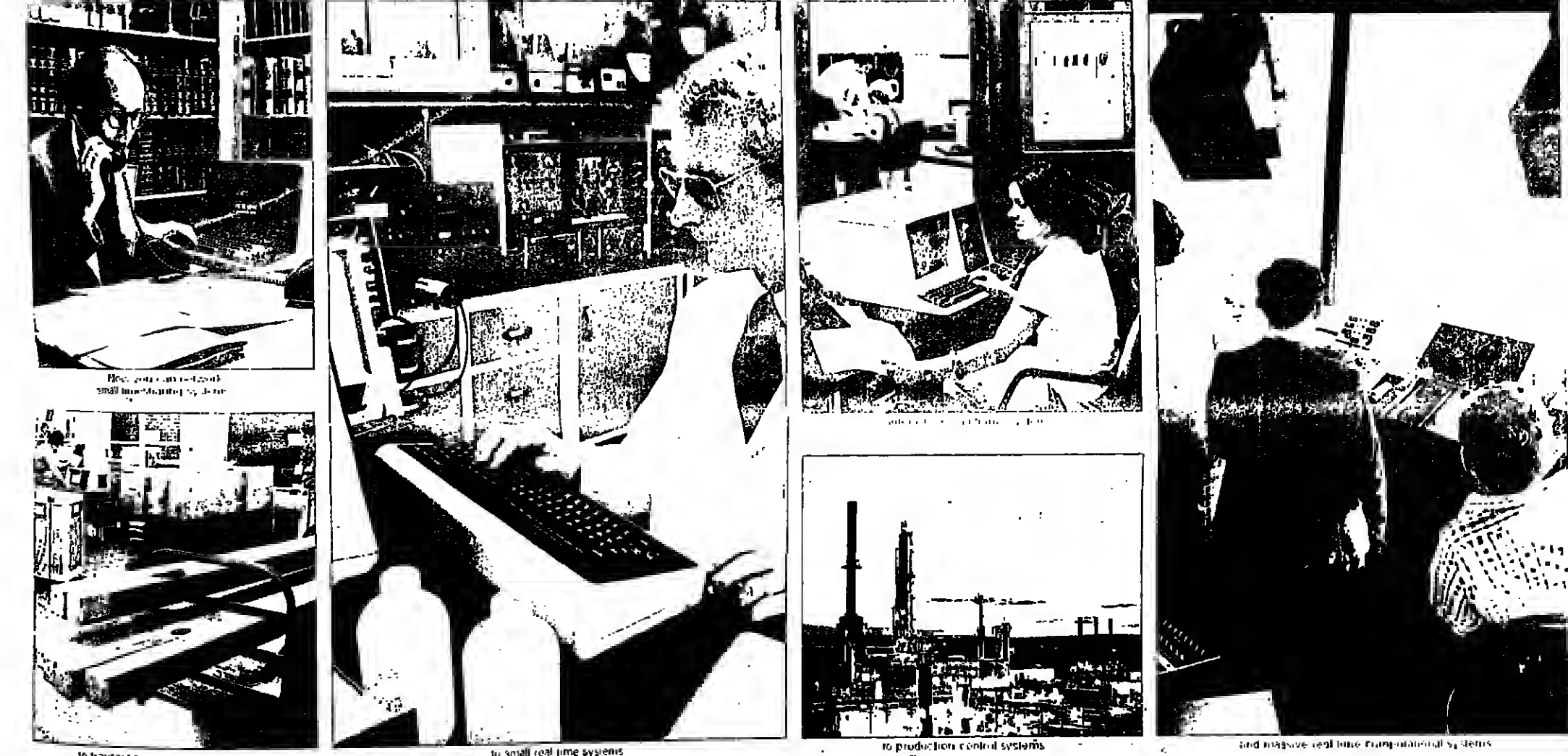
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## PEOPLE AND EVENTS

## Honeywell names PPS team

HONEYWELL Information Systems has announced the appointment of Tom Bane as national sales manager of Honeywell page printing system. A former manager of major international accounts, Bane will be responsible in his new position to John Macdonald, who is the UK director of PPS marketing. In addition to this appointment, David Hallatt has become a member of Bane's sales organisation, with emphasis on public sector and central government. The Honeywell page printing system is operated by the Level 8 minicomputer, and prints at speeds of 8,000, 12,000 or 18,000 lines per minute.

Paul Abraham has been appointed chief hardware design engineer with System Industries, and Colin Smith software engineer. Both men joined the company as engineers in 1977, and have recently worked for SI's parent company in America. New field engineer is Steve Papacharalambous, who is the company's microprocessor specialist. Bryan Schutas has become a sales executive, formerly having worked for Alex.



Bane



Hallatt



Macdonald



Papacharalambous



Schutas



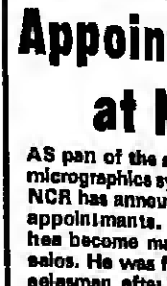
Macdonald



Hallatt



Abraham



Smith

## Director of Rascal

RACAL ELECTRONICS has announced the appointment of Leighton Davies as a deputy managing director. He will retain full responsibility as chief executive for the Racal Data Communications Group. Davies has been in charge of this division since 1988 when he became managing director of Racal-Milgo. He was previously general manager of transmission and data systems with Standard Telephones and Cables, and prior to that was managing director of GEC Computers and Automation, in Wembley.

Ashley Ward has joined London United Computing Systems as a sales consultant. He was previously a professional works motor racing driver.

David Lewis has become managing director of Siplur Designs. He was formerly manager of data communications for the Stock Exchange's Talsman system, after working as a consultant with Software Services.

Eric Lipscombe has become associate sales director of ICL, with responsibility for Central London before joining the company. Lipscombe was a senior marketing manager with IBM.

Greg Smith, until recently general manager of marketing with CDC, has been appointed as consultant marketing director and executive director of the Apple Foundation. Before joining CDC, Smith was vice-president of product management and development at Bell and Howell.

John Henry, vice president of product marketing with Centronics, has been appointed vice-president of European marketing. He will be based at the company's European headquarters in London, and will report directly to Terence Harris, vice-president of European operations.

## Appointments at NCR

AS part of the expansion of its micrographics systems division, NCR has announced three new appointments. Bernard Hunt has become manager of COM sales. He was formerly a COM salesman, after joining the company in 1985 as a computer operator. In his new position, he replaces John Weller, who has become manager of COM sales and support. Peter Morris, previously a salesman in micrographics with the company, has been appointed as a sales manager for micrographics sales in the North.

A chartered electronics engineer, Barry Gilder, has become product manager of the micrographics division. He joined NCR in 1985 as a design engineer at the Southampton laboratory, and later became a COM development designer.

Peter Ryan has been appointed special system sales manager at headquarters of Systems in Leeds. He was previously with Lucas Aerospace, where he was most recently employed as manager of automatic equipment.

David Hawkins, previously marketing manager of Bond Telecom, has been appointed as marketing director. He will be based at the company's European headquarters in London, and will report directly to Terence Harris, vice-president of European operations.

## DIARY

APRIL 18-19 Which word processor, and seminar Infotech, Regent Centre Hotel, London W1, 9.30.

APRIL 18 Trade union perspectives, Ian Henson, NCS London branch, Walcott Hotel, London WC2, 18.00.

APRIL 18 Microcomputers, an overview of current developments, NCS Stoke Hotel, Guildford, 18.30.

APRIL 18 The new information world, NCS South Essex branch, West Cliff Hotel, Westcliff-on-sea, 19.45.

APRIL 20 Seven-a-side soccer and dinner, NCS Belfast, Ulster Hotel, Belfast, details from W and F Heron, tel: Belfast 58415.

APRIL 23 Ennmore, P. Kelly, NCS data communication specialist group, NCS headquarters, 12 Mansfield Street, London W1, 18.00.

APRIL 24 What next in the office? NCC, Cate Royal, 48 Regent Street, London W1.

APRIL 25 Microprocessors, T.H. Road, Pentewan Road, Looe, Cornwall, 10.30.

APRIL 25 IBM CITA annual forum, Royal Bath Hotel, Bath, 14.00.

APRIL 25 ICS Sussex branch, visit to British Caledonian Airways, Gatwick Airport, London, 14.30.

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## Satellite copier deal clinched

AM INTERNATIONAL has formally announced the contract reported exclusively in Computer Weekly last month (CW, March 8), under which it will develop a computer controlled laser based copier system for the IBM joint venture, Satellite Business Systems. It will be able to scan and transmit one page a second — far faster than any existing facsimile system.

## BCPL sales and support firm set up

A THIRD Cambridge-based firm has entered the ranks of those offering to sell and support BCPL software. Called Fen-dragon, the company is able to supply a number of off-the-shelf BCPL compilers, with a notable emphasis on microprocessor systems.

Among devices currently supported are the Texas 9900 and National Semiconductor PACE. An interpreter is currently under development for the Zilog Z80, and further implementations are planned for the Motorola 6809 and Intel 8086.

Other compilers available run under RSX-11M, RSX-11D and IAS on the Digital Equipment PDP-11 and under Rds on the Data General Nova and Eclipse. Fen-dragon is at 197 Chesterton Road, Cambridge.

## Security service

WACKENHUT UK have established a data storage centre at Luton, with a view to opening further off-site storage facilities in London, Manchester, Glasgow and Bristol in the near future. The Wackenhut service provides security for back-up tapes, disc packs, microfilm and microfiche in air-conditioned, fire-resistant vaults which are controlled for stability of temperature and humidity. For the retrieval of information, Wackenhut has a fleet of radio-controlled vehicles which operate 24 hours a day, seven days a week.

## Storage firm bought

SAFESTORE, a firm which provides secure storage for computer media, has been bought by the Hays Wharf Group for about £20,000, and is now part of the Hays subsidiary, Hays Business Services Ltd.

Hays already owns another big security firm, Datakeep, which it acquired about two years ago.

Safestore's warehouse is on the bank of the Thames at Greenwich and the Datakeep building more or less faces it on the opposite side of the river.

Meanwhile, the public transatlantic facsimile service for UK postal users reported in CW last year (CW, June 15, 1978), looks like going live on a trial basis this summer, although the Post Office is unable to specify an exact date. Trials were originally intended to start last month.

Called Intelpost, the service will use the Intelsat satellite and facsimile kit built in the US by Rapicom of California. It will operate at 9.6K bits per second — one page in less than a minute — which is fast by conventional standards, but very slow compared with the satellite speeds that SBS is taking full advantage of.

Interpost will be available in all London postal districts and according to the PO it will be run like the Express Post service. Letters will be rushed to an office in central London where they will be scanned and transmitted via Intelsat to either of two destinations — New York or Washington.

Under its contract with SBS, AM International has to deliver two identical demonstration systems early next year. In operation, the AM system at each SBS location will deliver pages during the day, accumulating batches of images for each city, and will transmit the electronic "mail" at the end of the day.

Standing, appropriately, next to a scale model of a communications satellite are the chairman of AM International, Roy Ash, and Philip Whitaker, president of Satellite Business Systems.

## IBM figures stun brokers

WALL Street was stunned last week by IBM's first quarter figures, which showed net profit up "only" 13.2% at \$887 million on turnover up 19.4% at \$5,290 million compared with the first quarter in 1978. The fall in the value of the dollar cost IBM \$38 million in foreign exchange losses, a turnaround of \$66 million on the figure of a year earlier when it scored foreign exchange gains. Gathering inflation and investment for the future were named as reasons for the modest profit growth by chairman Frank Cary. The Dow Jones Industrial Index fell seven points on the news.

## High-speed bookings

INCREASED passenger traffic on British Rail's high-speed service from London to Edinburgh has prompted it to move seat reservations for the service to computer. Consultations with staff are still taking place so BR would not comment on how and from where it was planning to operate the system, but a spokesman did say that "it will be run on an existing IBM computer."

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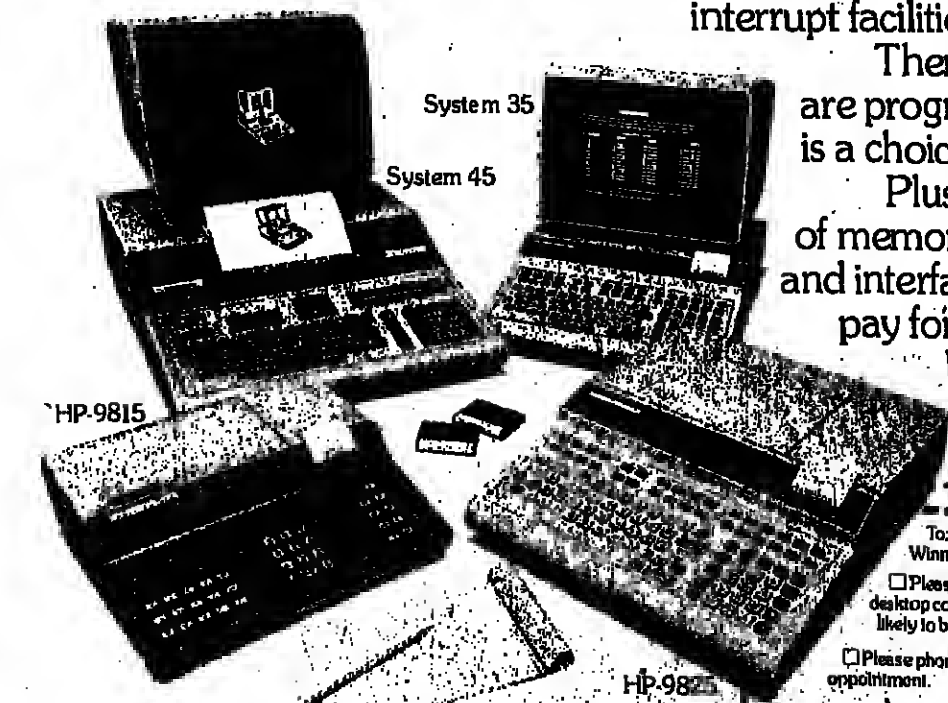
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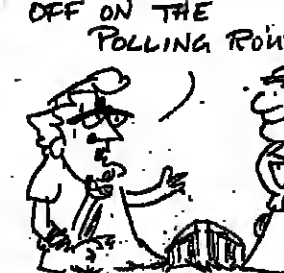
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by Don  
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## MICRO NEWS

## Zilog offers software multi-package for single board micros

A COMPREHENSIVE package of software to support users of its range of single board microcomputers has been introduced by Zilog. Centred on a floppy disc-based operating system, it incorporates a debugging monitor, text editor, macro assembler and a file manipulation utilities.

Available for a one-time-only charge, and therefore requiring no royalty payments for its use in other systems, the software is intended primarily for applications in industrial control, data logging and education, though it is also suitable for small business applications.

The PROM-based debugging monitor incorporates all terminal and floppy disc drivers required for system I/O. Its debug capabilities include break point setting, single and multiple program stepping, jump to specific addresses, and save memory contents.

The assembler is disc-based,

and is claimed to be one of the fastest available for any microcomputer. It can generate object code and listing files at a rate of 500 lines of source per minute, a rate that can be increased if no listing file is required.

Source code can be read from one or more discs, while the object code is written directly to disc. Diagnostic messages, however, are transmitted directly to the terminal.

Another feature of the assembler is that there is no limit to the size of the symbol table. If the memory allocation is used up, more space is allocated on the disc and paged up as required.

The editor is line oriented and can deal with very large files, regardless of the size of available systems memory.

Among the file handling utilities available are Cat, for cataloguing directories on disc, and Combin, for merging files.

## Revised MCS-48 Assembler

A REVISED version of the MCS-48 Micro Assembler has been produced by Intel for which the company claims a full 100% performance improvement over the previously available version.

Called Version 3.0, it permits program development work to be carried out on the Intel Development System for the full range of microprocessors in the MCS-48 family.

## History of semis

THE Microelectronics Revolution: A Brief Assessment of the Industrial Impact With a Selected Bibliography is the title of a new study produced by the Technology Policy Unit of Aston University. The 87-page report gives a brief history of semiconductor development and looks at the many industrial application areas for the technology. It costs £3.

## Dutch order 1,000 personal systems

DESCRIBED by its makers as a "second generation" machine, the DAI personal computer, from Brussels-based Data Applications International SA, has already won an order for 1,000 systems from a Dutch educational organisation, even before its official launch at Compe Europe next month.

The Dutch organisation, Teleac, is using the systems in conjunction with a microprocessor education course transmitted over Dutch television every week. The systems are supplied to students as part of their course material.

Though basically similar in approach to the UK's Open University, Teleac has been in negotiation with Thames Television in England, and there have been some suggestions that Thames may purchase the Teleac series.

Thames itself has so far indicated that it does not plan to do so, though it is currently preparing three pilot schools programmes on the microprocessor, for transmission in the spring of 1980. If successful, a full course will be considered for the 1980-81 academic year.

The DAI machine, according to Data Applications marketing manager Nimal Jinadasa, was selected by Teleac after a comparative evaluation with several other well-known personal computer systems, including the Apple II, Pet and Tandy TRS 80. The decision, in part, was based on the fact that these systems are not true personal computers and have only limited applications, he said.

The DAI definition for this "second generation" machine is that it covers a variety of applications ranging from home use through to a variety of professional applications in the one system.

Based on an Intel 8080 CPU the system achieves this flexibility of application, according to Jinadasa, by utilising the DAI common bus structure. Coded the DCE bus, this makes the system compatible with the full range of single board computer systems and industrial control systems the company produces. It can therefore be used as the central processor in a variety of industrial and process control applications as well as being a stand-alone computer.

In its basic configuration, the system comes with 8K bytes of

By Martin Banks

memory. This is expandable to 48K bytes with memory mapping. Secondary storage is by cassette recorder, though floppy disc system and a printer are optional extras.

The prime output medium is the domestic TV screen and is made possible by a video interface which can be used with all three major colour television standards - PAL, SECAM and NTSC.

The software is a semi-compiled Basic, which is claimed to be very fast. It is maintained in the system's memory as an intermediate code. It provides such facilities as split screen operations, and has a 200 x 200 matrix high resolution graphics capability.

Though the software operates with floating point maths, there is also an option of including the AMO 80 floating maths chip. A sector provided for this in the system and the software monitors its socket for the presence or absence of the chip.

DAI is also independently tracking the same path as the Instruments with its up-coming personal computer introduction, by including a speed synthesis capability (C/C, 4/12).

The system has a set of white noise generators in which can be used for music and speech synthesis. The price, in Belgium, is expected to be between 30,000 to 40,000 Belgian Francs, equivalent to a range of £16,000.

## Version of Pascal for the micro market

A DUTCH company is now selling a version of Pascal specifically aimed at the personal computer market. Systems such as the SWTP 8801, with sufficient hardware to support the TSC Flex 1.11 operating system, are more than adequate to run programs written in the high-level language.

Available from Tachdata, which is based in Vnoorburg,

Holland, the software can compile and run Pascal programs on a minimum of 12K plus 8K bytes of memory. The compiler has been written in a subset of Pascal and incorporates such functions as Files, Procedures, Records, and Sets, as well as looping and branching constructs. It also incorporates some of the features of micro functions, such as File, Poke and User.

One of the more interesting aspects of the software is the inclusion of a page mode facility. This is brought in automatically if there is insufficient real memory for a large program.

The Pascal compiler and the P-code Interpreter/Run-Time system is provided on a 5.25" floppy disc in File 1.

## IC plant set up by Storage Technology

TO complement its \$32 million takeover of the California-based LSI design house, Micro Technology (CW, March 22), Storage Technology has started work on a new 80,000 square foot semiconductor facility at its Boulder, Colorado headquarters.

The new facility will be used to manufacture medium speed, medium density circuits, and thin film heads for disc memories. Pilot production, for internal consumption only, is scheduled to start in 1981.

A major reason for STC to move into the microelectronics manufacturing business is the company's need to cut back on its current nine-month design turnaround on new devices currently provided by the semiconductor industry. By vertically integrating its operations downwards, STC will be able to make use of the LSI CAD software possessed by Micro Technology.

## Versatile desk-top system

A COMPACT desk-top computer system capable of being used either as a stand-alone system or as an intelligent terminal for a larger computer has been developed by Kenner Micro Systems.

It incorporates a 12-line video display, an ASCII keyboard with a function key, a floppy disc drive and a parallel I/O port. Kenner has a range of applications software for use on the system, which is called Series 1000. It is a portable, modular and expandable system.

## INDIAN SCENE



ICL corporate director Peter Hall sits up the potential threat to ICL as world markets from the first Indian-designed and built mainframe. A 370/138-class machine, the computer, the TDC-332 is under test at ECIL's plant in Hyderabad, surrounded by banks of empty busbar cooling fans.

## ICL director irked by delays

THE first Indian mainframe ever built, the TDC-332, is still under test at ECIL's factory at Hyderabad, Andhra Pradesh, and is, in theory at least, the only indigenous competitor to the 2904S ICL intends to build in India.

ICL corporate director Peter Hall was a member of the EEC delegation which visited India last month to examine the prospects for both hardware and software collaboration, and missed no opportunity to complain about the problems ICL is facing in India.

The two ICL companies in India, the 100%-owned marketing company and the 60%-owned manufacturing company have now been merged into a single

40%-owned company, ICIM, International Computers Indian Manufacture. The dilution of ownership was achieved by a rights issue to existing shareholders, and any rights not taken up were offered to employees of the company. A further rights issue is to be made shortly to raise more working capital.

Granted a letter of intent for a licence to build a hundred 2903/4 machines - which would be specially adapted to the Indian environment - ICIM is still waiting for the go-ahead from the Indian government. The present problem is that, whereas the 321601As built in India were manufactured by Bharat Electronics in Bangalore, the 2904S

are to be built at ICL's own light, airy and spacious factory in Pune. However, the Maharashtra State government has placed restrictions on new manufacturing in Pune, and this issue has stalled grant of the licence.

The TDC-332 mainframe in the picture (above left) is based on the architecture and the Sirls-3 operating system of the CII Iris 50 mainframe, which itself was a development of the Xerox Sigma 7.

The architecture has been adapted to accommodate IBM-type multiplexer and selector channels, will have up to one Megabyte of semiconductor or core memory, and will support up to three front-end processors.

## Russian contracts

UNDERLINING the extent to which the Russian computer industry is making use of Indian skills and resources, all the core memory for Risc computers currently being shipped from Russian plants is being made at Electronics Corporation of India Ltd, ECIL's plant at Hyderabad. ECIL is government-owned, and is an offshoot of the Department of Atomic Energy.

The contract with ECIL runs for three years, and our picture shows one of the 64K-byte memory stacks being strung at the big ECIL factory. Eastern Europe mainframes are in general still supplied solely with core memory, and 20 mil cores are used. ECIL imports the cores from Western suppliers, but everything else is made at the plant or bought in locally.

The Russians also do extensive system software procurement for their mainframes in India, and Computer, the big services company which acts as agent for the Risc machines in India, is also supplying the Russians with software worth £1.2 million annually.

In general, the Russians pay for the software with computers, and the value set tends to be artificially low. Computer's role is nevertheless thoroughly satisfied with the business relationship with Electronorgtechnika, the Russian agency which handles the deals.

## Reports by Tim Palmer

## Waking up to the bit-slice micro

INDIAN companies have not been slow to recognise the benefits offered by the bit-slice microprocessor, in particular the ubiquitous AMD 2801 four-bit device.

The chips are particularly attractive in the Indian environment where it is much easier to get an import licence for microprocessors than for a minicomputer and where a bit-slice mini can be classified as a microcomputer.

Several members of the giant \$1,200 million Tata Group of companies, involved in power generation, have formed a joint research and development company, and one of the projects under way there is the develop-

ment of a bit-slice emulation of the PDP-11/34.

There are no plans to market the new machine. It is being developed for two reasons: to give the research engineers experience in bit-slice technology and microcoding techniques, and to provide a tool for use in the laboratory for development of defence applications.

The microcoding will be done at the Tata Institute for Fundamental Research, the educational and research centre where India's only established minicomputer, the TDC-312 and 316 were conceived.

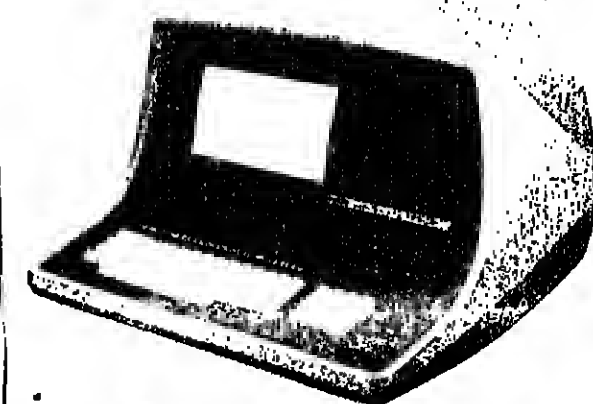
The plan is to build six machines which will be installed at the Tata Electric Companies' research laboratory, where

work is done on Indian defence projects.

Defence is by far the largest single user of computers, and has about half the DEC PDP-11s in use in India.

Other microprocessors in use or being assessed include the Intersil 6100, the 12-bit C-MOS microprocessor which has the same instruction set as the Digital Equipment PDP-8 minicomputer, the Intel 8086, the Zilog Z8000 and the Motorola 68000.

THE MICROPROCESSOR PROMISES TO REVOLUTIONISE THE INDIAN COMPUTER SCENE IN AN EVEN MORE COMPREHENSIVE MANNER THAN THAT OF THE WEST. IN THIS, THE FIRST OF AN OCCASIONAL SERIES ON THE INDIAN HARDWARE SCENE, TIM PALMER, WHO WAS A MEMBER OF THE RECENT EEC HARDWARE DELEGATION, TAKES A LOOK AT DEVELOPMENTS AT ICL, TATA-BURROUGHS, ECIL AND TATA ELECTRIC COMPANIES.



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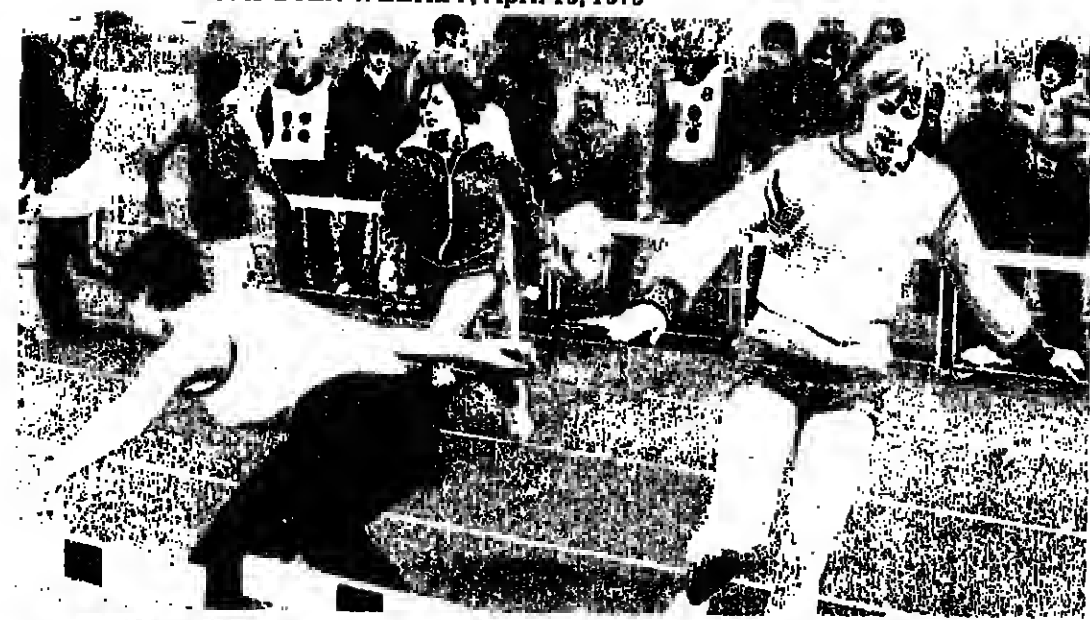
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ABOVE — one event that attracted plenty of attention — especially from the men — was the Ladies short sprints. This involved running backwards and forwards across the width of the track. Stewards in white jackets counted the number of laps.



LEFT — Seicon's Pete Nicholls is out of sight of the rest of the field in the Mens 800 metres race, the last event of the day. He led for first place in the individual contest. The ladies were let off with a 500 metres race.

## Tie means five take trip to finals at Crystal Palace

THE miserable weather failed to damp spirits at the Midlands Qualifying Heat of Computastars last Sunday and, due to a tie in the Mens events, five teams go to the finals.

Held at the New Alexander Stadium, Perry Barr, Birmingham, Ladies tennis from Smedley-HP Foods, 54 points; Safe Computing, 50; and Data Sciences, 40. John Mens teams from Seicon, 105½; Data Sciences, 102½; and Peterborough Data Processing, 98, for the trip to the finals at Crystal Palace in September.

Competition in the individual events was very tight with one point separating the winners. These were Angie Dunston, Safe Computing with 20 points; Marilyn Broad, Data Sciences, 19; last year's individual silver medalist Dave Beardsell, Peterborough Data Processing, 28; Pete Nicholls, Seicon, 28; and Viv Oliver, Safe, 27.

The Nottingham-based Midland Household Stores shone in the Secondary Com-



petition which consisted of netball shooting for the ladies and a tug-o-war for the men.

The trophies were presented by John Colling, managing director of Wright Air Conditioning who is a co-sponsor of the event with Computer Weekly.

Ladies tennis — Gammon

Associates, Nottingham; Smedley-HP Foods, Leamington; Press Computer Systems, Wolverhampton; Bosc, Birmingham; Data Sciences, Birmingham; Link, Oxford; Midland Household Stores, two teams, Nottingham; Electric, Telford; Safe Computing, Leicester; and, Seicon, Milton Keynes.

Mens teams — Gammon Associates, Nottingham; Smedley-HP Foods, Leamington; Press Computer Systems, Wolverhampton; Crane, Southampton; Peterborough Data Processing, Peterborough; Roots, two teams, Nottingham; Data Sciences, Birmingham; Link, two teams, Driffield; Midland Household Stores, Birmingham; Thorn Electric, Telford; Safe Computing, Leamington; Seicon, two teams, Milton Keynes; and, W&T Ayr Walsall.



ABOVE — part of the art of tug-o-war is guessing the right time to pull at your opponents. Seicon won a tug from Midland Household Stores in the final.

For the next heat Computastars moves to Bristol for the South West session where 20 teams will compete at the Whitchurch Sports Centre for a place in the Crystal Palace final.

The third meeting will be the first London area contest and 42 teams will meet at the Sports Centre, Crowley, Sussex, on April 29. The competition then moves to the North East, where on May 13 at the Westcliffe Mount Sports Centre, Cleek-haston, near Leeds, 38 teams will pick their strength and skill for a place in the finals.

And then it's on to the final at Crystal Palace on Saturday, September 29, to find the 1979 champions.



LOOK what we've won! Julie Seaton, captain of Smedley's Ladies team holds aloft the Ladies Trophy after being presented with it by John Colling (right) managing director of Wright Air Conditioning, who co-sponsored the event with Computer Weekly. With 54 points, Julie's team now takes the trip to Crystal Palace for the September finals.



ABOVE — smiles all round as Pete Grey (left) captain of Seicon's Mens team collects his team's trophy from John Colling. On the right is Computastars' organiser Gordon Colms who was responsible for running the competition at the New Alexander Stadium, Perry Barr.

LEFT — will it or won't it? Jenn O'Neil, of the Midland Household Stores' team, waits to see if she has netted the ball. Organiser Gordon Colms (left) has his pen ready to mark the score. This event was the ladies part of the Secondary Competition which John's team won well.

BELOW — the starter's gun sets in motion the last event of the day, the Mens 800 metres. Pete Nicholls (centre, wearing Seicon vest) left the rest of the field behind to secure his team of a place in the finals at the National Sports Centre, Crystal Palace in September.



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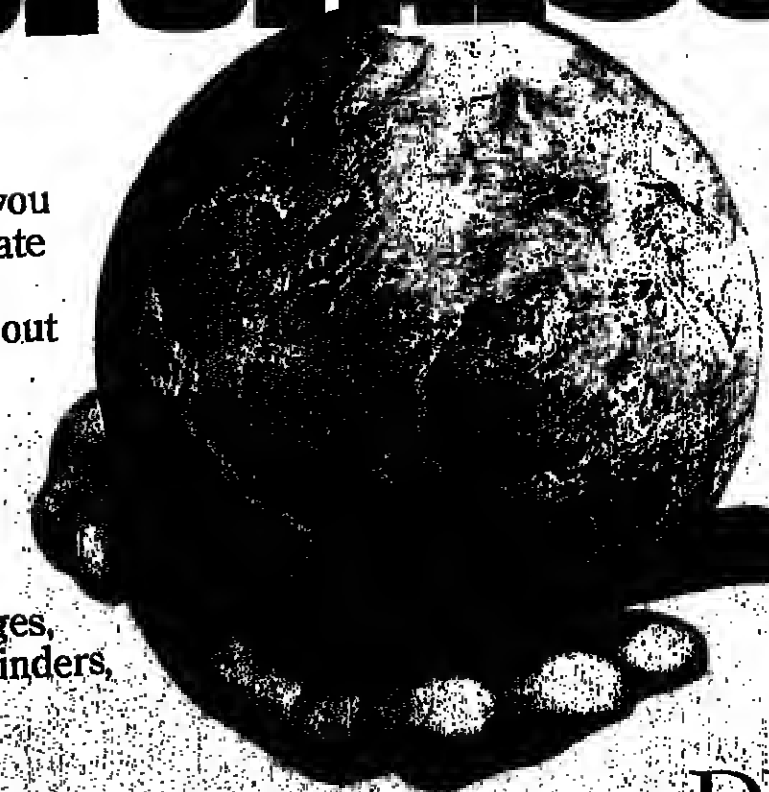
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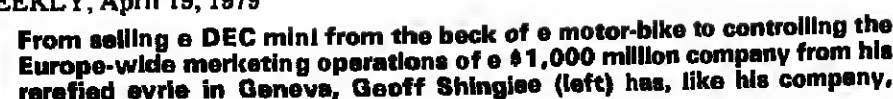
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**Digital Equipment, grown big by thinking small. TIM PALMER reports on the metamorphosis in the lifestyle of both company and executive in a changing environment.**

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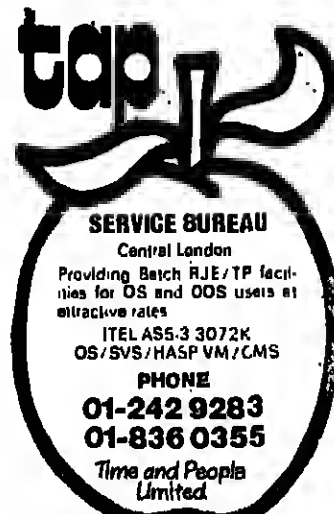
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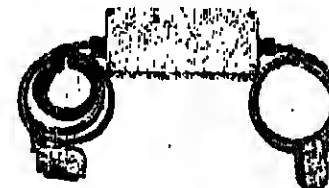


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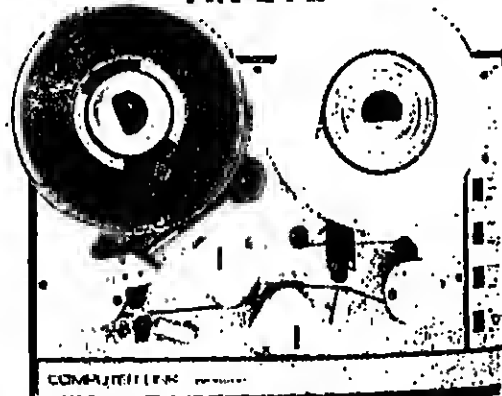
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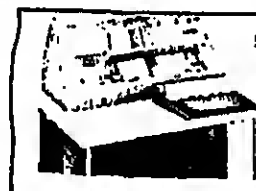
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**COMPUTER WEEKLY**

01-261 8293



# Peripherals market to decline in 1980s

—SAYS US CONSULTANCY

THE market for computer peripherals in the US will decline in dollar value in the 1980s despite a massive increase in shipments of mini and microcomputer systems. This is one of the main predictions made in a report\* from the US consultancy International Resource Development Inc.

## 'Micros will keep young people in work'

UNION leader Moss Evans hailed the microprocessor chip as a means of keeping young people at the helm, when he spoke at an election meeting with Energy Secretary Tony Benn in support of Coventry S.W. Labour candidate Mrs Audrey Wiles.

Attorneys Evans, general secretary of the Transport and General Workers' Union, told Computer Weekly that if the Tories were elected, they would rely on the private sector for funding further development of chips.

In his experience, this would not happen, adding that further developments in microprocessors must have some State support.

He believed that the micros were a means of improving the quality of life and urged the next Labour Government to make micros work for Britain.

The report looks at 38 different categories of peripheral equipment, the combined shipments of which had a value of nearly \$7 million in 1978.

There will be price cuts in most of the categories, according to the report, so that in many cases the expected increase in unit shipments will not compensate for price reductions.

Looking at specific product types, the report predicts that the "skyrocketing" growth of floppy disc drive sales will continue, while reel to reel tape drives will be saved from extinction only by the spread of Winchester technology in disc drives. Some form of removable magnetic storage is needed to load the fixed disc.

Spectacular growth is predicted for sales of printers designed to be used with mini and microcomputer systems and the rapid upsurge in terminals will continue.

But the excess of supply over demand which has persisted in some sectors like teletypes, over the last three or four years is likely to come to an end as manufacturers like Digital Equipment, Teletype Corp and Data General bring massive new assemblies into operation. The report sees IBM

remaining the largest supplier of peripherals as well as processors, but notes the erosion of IBM's medium/large market by plug compatible peripheral and processor suppliers like Storage Technology, Mamorex, Amdehl and Intel.

It also believes that IBM's prospects if it enters the microcomputer systems market will be uncertain because of the presence of Tandy in particular, and potentially Texas Instruments.

\*Computer Peripherals in the 1980s, \$1,265, 278 pp, International Resource Development Inc, 125 Elm Street, PO Box 1131, New Canaan, Connecticut 06840, USA. Tel: 0101/203/968/5615.

## Warrants out for two in bank wire transfer

HOT on the heels of Stanley Rifkin's jail sentence for bank fraud via computer (CW, March 28), arrest warrants have been issued for two employees of another Los Angeles bank who allegedly transferred \$1.1 million from their computer to New York banks in order, like Rifkin, to buy diamonds.



THESE children, from Romsey School in Hants, are to see a large real time order processing system in action. James Neill, appropriately for Sheffield, makes hand tools, and uses its Univac 1108 to handle stock control, orders, invoices, and packing notes, by means of online VDUs.

The children also saw a new £1 1/2 million Univac 1100/80, which is to replace the 1106, in the process of being installed in Neill's computer room.

The trip had been arranged to supplement classroom work on computing with knowledge of how a big commercial system works in practice.

Our picture shows David Neill (right) from Neill's Computer Division with a group of the Hants pupils.

## NEWS IN BRIEF

### PO lowers profit target

THE profit target for Post Office Telecommunications is 5% a year for the next three years, lower than the target for the three-year period ending March 31. The revenue from data services is only 1% of the total for telecommunications, and although this is growing, the ratio is staying the same. In 1978, data services revenue was £3 million and the total net profit £1 million. Last year's performance is expected to achieve a similar success.

### Name change

JACQUARD Systems of High Wycombe has changed its name to AM Jacquard Systems Ltd following the acquisition of the US parent company, Jacquard Systems of California, by AM International last December. Jacquard builds the JIK and J500 systems for data and word processing.

### System 2000

MRI's System 2000 database management system has been made available by London-based Computing Systems, which joins SIA in offering the system on a bureau basis in the Midlands at the Kansas City data centre of United Computing Systems, the DBS, accessed by UK users via the transatlantic data link.

### Atomic law

INFORMATION on law relating to atomic energy is to be made available to the public by the Atomic Energy Commission. A workshop was held in Paris last week by the International Atomic Energy Agency and OECD to determine how input would be processed by what problems would be raised by the non-scientific nature of the data.

### Olympic message

A CONTRACT for nine S22 16.45 and 16.40 minicomputers for use in processing data for the Olympic Games in Moscow has been signed between the Soviet Union, a member of the Transatlantic group of companies, and the Transatlantic group.

## Memorex on the move

MEMOREX has moved its UK headquarters from Hounslow to Slough where the company has just moved into premises that include 11,000 square feet of office space and two temperature controlled warehouses totalling 40,000 square feet. Memorex has also replaced its Coventry and Leicester offices with one office at Nuneaton.

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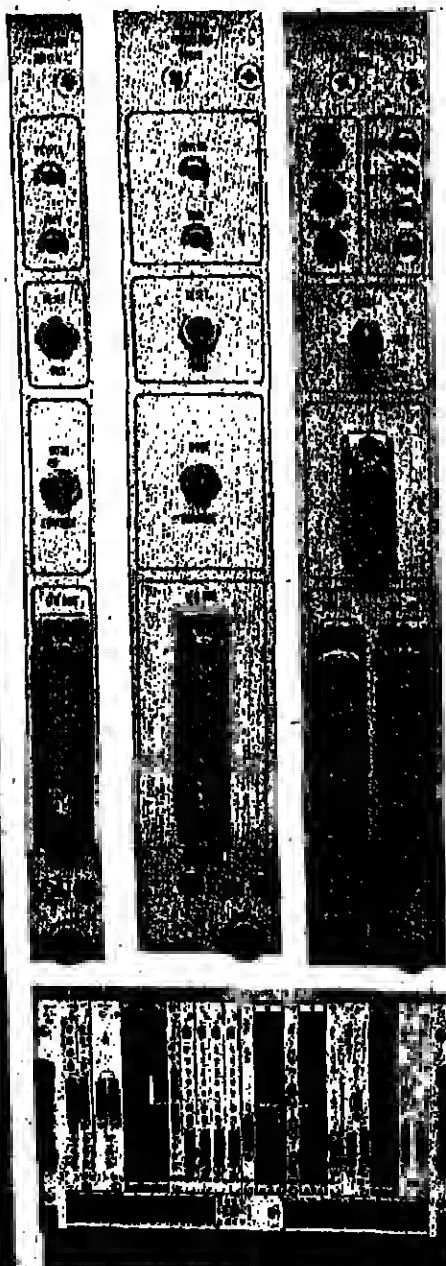
The 9081 Microna Processor is designed around Data General's MicroNova™ microprocessor chip. It is configured complete with 16K RAM (9081A) or 32K RAM (9081B), together with a PROM programmed for automatic program load. The Processor is connected to peripheral devices via a front panel serial I/O bus, and communicates with Camac via a 9089 Microna Controller. A series of printed circuit mounted switches allows the 9089 to be used as a Crate Controller in stand-alone systems, or as an Auxiliary Controller connected to a type L2 or A2 Crate Controller via its rear panel connected Auxiliary Control Bus. In distributed systems, furthermore, a whole series of 9089 modules may be interconnected within a Crate via the ACB thus permitting multiprocessor configurations sharing the same Dataway.

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## TIM PALMER LOOKS AT SOME OF THE PRODUCTS AT HANOVER FAIR

# The shift to software finds expression at the show

THE short history of the computer industry has been one of rapid evolution rather than revolution, but a revolution is now taking place — the inexorable shift of value out of hardware and development expenditure to a key indicator to the way things are going to go, and every company one talks to today is now spending at least as much on software development as on hardware, and many have tipped the balance firmly towards software.

The Hanover Fair, which opened yesterday, Wednesday, and closes on Friday, April 27, has this year consolidated its position as the world's premier computer exhibition by acknowledging this revolution and setting up a section devoted to software at which 30 companies are due to exhibit.

Hanover '79 provided the launchpad for the most successful computer product ever introduced by any of the constituent companies which make up ICL — the 2803.

At that time, ICL Germany was one of the company's most troublesome subsidiaries, chronically unresponsive to all management efforts to make it profitable. Today, following the merger of the local ICL and Singer companies, the situation is transformed, former ICL customers are buying ex-Singer products, Singer customers are buying from the long-standing product line, and ICL is hoping that this year's show will

provide an even more successful launchpad for a new model in the 2803 series — the 2805.

Information is currently to hand on only a few of the thousands of computer products which are on offer at Hanover this year, but items which are of particular interest include the new bottom-end Siemens 7000 series machines — the 7706, 7708 and 7718 — which offer a low-cost entry into Siemens' mainframe line and the BS2000 operating system. The three small machines, announced even before the IBM 4300 line, but addressing the same market, will undoubtedly spearhead Siemens moves into countries where it is at present not marketing, and that could include the UK.

Also worth tracking down is the German business systems company David Datentechnik, DDC. Starting off with a Data General Nova-based system with widespread use of ancillary microprocessors for peripheral and terminal control, DDC, which opened its doors less than four years ago, has grown in a phenomenal rate, and is now building its own bit-slice processor, using the ubiquitous AMD 2801.

The Eastern Europeans traditionally turn out in force at Hanover, with Bulgaria showing discs, Poland showing small computers and printers, and East Germany showing office machines and process control minis. But ahead of the field with East-West business in general

purpose rather than office computer products are the Hungarians, who have made a successful entry on to the West German market with their display terminals and are keen to expand their trade in this field.

The Japanese also exhibit at Hanover in increasing numbers

unknown in Europe are following in their wake, and Hanover provides an unusual opportunity for students of the world computer industry to make personal contact with people who are au fait with the Japanese scene.

West Germany's one surviving independent



The lynchpin of the Mohawt Data Sciences product line these days is the MDS Series 21, the distributed processing system which combines data entry and file inquiry at multiple workstations with local processing in the proprietary Mohawt-like 'Mabel' language. Zilog 280-based, the Series 21 includes three models, the 20, the 40 and the 50; the picture shows a 21/40, which can operate as a stand-alone computer system.

each year, in general to seek agents and evaluate market acceptability of their products. Nippon Electric has been at the forefront of this move, but other manufacturers of small computers at present almost

minimally, Dietz Computer Systems, remains profitable and confident that it can continue so for many years to come. The bit-slice microprocessor has dramatically reduced the cost of remaining viable in the



minicomputer business, and Dietz has been making full use of it.

Principal novelties from Dietz are a new model of the basic machine, the Dietz 621, and a floppy-disc terminal system for decentralising applications around a host 621 machine.

The new model is called the 621 Compact, which is a disc-backed interactive computer system, officially, according to Dietz, especially attractive price-performance characteristics. ANSI 74 Cobol is now on offer with the 621 line, and the company is also demonstrating attachment to an X25 network using the Dixos networking software on the bit-slice Micro-621.

The new terminal system is the Dietz 600/20 which is floppy-disc backed and can be used as an interactive terminal to other Dietz systems.

Dietz is also moving strongly into the Computer-Aided Design field via its Technovision subsidiary, and is demonstrating its capability in this field at the show.

New from Centronics is an undefined by nine matrix printer, the 753, which the company believes produces fully acceptable output in word-processing applications. It features a 130-150 cps print speed, proportional or standard width spacing and line justification. The company is also offering the new 704 communications printer which has an integral V24 interface.

Feller, of Horgen, Switzerland, is showing its journal tape reader, which is designed for reading journal roll tapes and can handle OTR-A, DCE-B, IBM 1428 and NC-R-10F characters.

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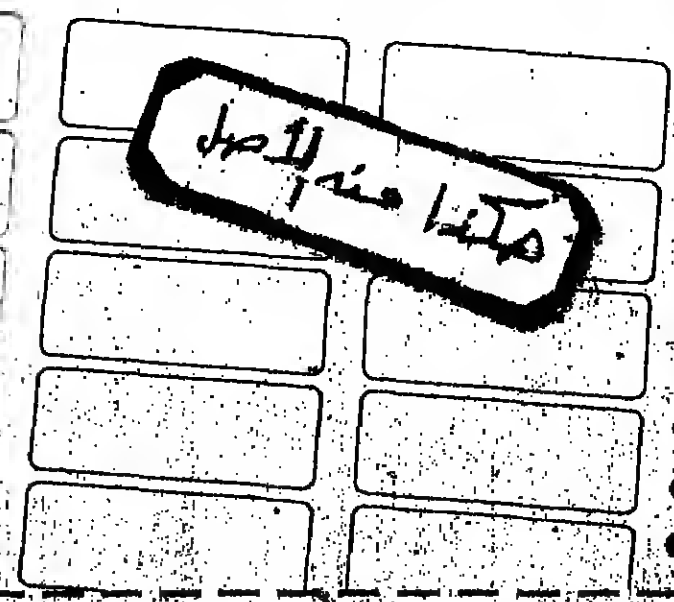
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# Users and makers back multifunction terminals

TELEPROCESSING is a Pandora's box, in the opinion of Edward Gistaro, senior vice-president of marketing for Datapoint.

"Once you start, you find that you want to do more processing at the remote site, add more applications and communicate with more people," he explains.

This view of the teleprocessing helps to explain the current interest in distributed processing and networks. It also accounts for the emergence of a new and powerful data processing tool — the multifunction terminal.

Users are migrating to multifunction terminals in a variety of ways, but a typical scenario might go like this: a company with centralised data entry decides to decentralise, putting its key entry terminals close to the source of the data for extra timeliness and input accuracy.

Here, the thinking is that the terminal operators will be more familiar with the data entered and will thus be able to spot input errors and correct them.

The next step is to economise on data entry and remote batch activity by consolidating both functions on the same terminal system.

Usually, the terminal will include a processor and, before long, limited local processing capability is added. Finally, the full potential of the terminal is used by first providing inquiry into host databases, and later by adding inquiry and management of local files.

In its full-blown maturity the multifunction terminal provides intelligent data entry, remote job entry, online and offline file inquiry and management, and stand-alone processing — plus the appropriate communications capabilities.

As with distributed processing, the standard bearer for these multifunction devices has been the intelligent terminal vendor.

Over the past couple of years, though, other suppliers have

been jumping on the bandwagon with a variety of approaches.

Traditional remote batch terminal vendors such as Data 100, for instance, began by adding data entry capability to its products. Likewise, suppliers of data entry terminals started incorporating remote batch functions.

Both groups have since built up the online inquiry and stand-alone processing features of the terminals.

Meanwhile, minicomputer suppliers are attempting to get into the act by building on their communications and processing knowhow and developing the appropriate terminal and software products.

Mainframe manufacturers have also been active in providing intelligent terminals, and in unravelling network architectures that make it easier for users to distribute functions among many or all terminals in the network.

Each approach has its strengths and weaknesses, based on the experience and origins of the vendors.

For instance, data entry vendors are typically strong on understanding user needs and tailoring the terminal system to those needs, but tend to be weaker in communications and stand-alone processing features.

Suppliers of minis and remote batch terminals, on the other hand, are usually strong in communications processing, but relatively inexperienced in dealing with end user needs.

More recently, another user alternative to achieving multifunction capability has arisen in the form of value-added network services.

One of the features of AT&T's planned Advanced Communications Service, for instance, is the facility for terminals with various protocols, speeds and codes to cohabit on a single system.

Also, ACS will allow users to customise such "communica-

tions processing" functions as data entry, RJE and inquiry/response to handle their specific applications needs.

Last October, as if in response to the threat from ACS and intelligent terminals, IBM made its blockbuster announcement of the 8100 Information System — a competitively priced product that incorporates extensive networking capabilities, advanced memory technology and elaborate and unbundled software.

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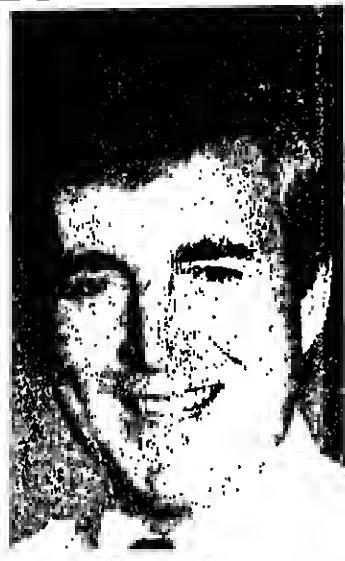
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## By Morris Edwards

Users are migrating to multifunction terminals, writes MORRIS EDWARDS. Opening what has been called a Pandora's Box, he surveys the growing number of suppliers of equipment in this field of teleprocessing.



Expected to find widespread use as nodes in either 303X or 370 host-based networks, the 8100 system can also operate as a stand-alone device or in conjunction with other 8100 systems in a point-to-point network.

Accordingly, it provides backup should the host become inoperable; and, through direct communications with another 8100, it can bypass the host in performing selected processing functions, thereby reducing overhead and freeing the host capacity for other uses.

Robert Fertig, technical director of Advanced Computer Techniques believes that distributed

data processing will become a vehicle for integrated information systems — systems that include the automated office as well as traditional DP activities.

He thought the fact that IBM called the 8100 an "Information System" certainly suggested that it shared this view of the future of distributed processing.

Along with its 8100 announcement, IBM also unveiled its 3730 distributed office communications system, which in-

cludes a text display station for keyboard entry and retrieval and a high-quality printer.

Supported by new models of IBM's 3781 communications controller, the 3730 is designed to tie into a host 370 for applications such as electronic document filing, retrieval and distribution, running concurrently with data processing applications.

Since the 3730 will be marketed by its data processing division rather than the office products division, IBM is seemingly convinced that the thrust for office automation will come from an organisation's data processing department.

Also, basing the office system around the 3781 controller adds credence to Fertig's belief that IBM's distributed processing terminals will be the nucleus around which the automated office will be built.

How are the traditional intelligent terminal suppliers responding to the challenge from these varied competitors? Seemingly by continuing to stress the multifunctional capabilities of their systems and, increasingly, by enhancing their networking capabilities.

Datapoint, for instance, has developed a networking tool called DSNNet which permits a central Datapoint processor to use remote terminal files with all the facilities, access methods and programming ease that would be available if the files were local.

Sycor is also emphasising multifunction capability and networking with its latest product offerings. Last May, the firm announced a new multifunction operating system that significantly enhances the performance of its top-of-the-line 445 distributed data entry and processing systems. Called Omnitosk, the operating system provides users with 256K bytes of main memory in the 445 to perform applications.

In the networking arena, the firm's major offering is Sycorlink, a resource-sharing feature that permits linking of multiple processors and the sharing of all disc files and peripherals in the network.

Sycorlink is an option which can be added to a Sycor 445 or 405 system. It allows users to transfer requests for files and access to peripherals from one system to another — transparent to the operator and the applications program.

Four-Phase Systems has been

directing much of its distributed processing efforts into multifunctional work stations. In a move to enhance the performance of a multifunction terminal, the firm has introduced a processing package called Vision IV/80.

Included in the Vision package is source data entry, inquiry and retrieval, local file management, report and document generation and local communications capabilities.

More recently, the firm has announced its Multitask Executive, which permits a single Cobol Processing word processing to be added to the Vision capabilities.

For word processing, the ForceWord package can be used from any display station to transcribe dictation, review report or write and edit directly from the keyboard. ForceWord can also transmit and receive texts through communication with other computers.

Raytheon Data Systems has apparently eluded at large IBM users with its distributed processing systems, since it provides compatibility with IBM line disciplines and offers a broader choice of options than the industry leader itself.

For example, besides supporting bisync and SDLC, the firm supplies software packages to permit its terminals to operate under the X25 protocol with domestic and foreign public networks — something IBM has yet to introduce with its.

Included in the communications options with its PTPS system are bisync protocol 3270 emulation, 2780/3780 11sup multileaving for RJE, and its SDLC protocol supports batch and interactive transmission simultaneously on a single communications line with stream modems.

Raytheon was also the first IBM company to link 3730 terminals to public networks using the high-level data link control, HDLC, protocol of the X25 standard.

To do this, it replaced control and emulation programs in the IBM 3704/3705 front-end processor.

Turn to page 23

## Multifunction terminals win support

From page 22

sector with a package called DMEP-11, and loads Raypac software into local PPS-100 terminal controllers.

The PPS-100 is an intelligent terminal system that complements the PPS/1200 line and is reportedly one of the world's most popular intelligent terminals, with over 50,000 units installed.

For networking applications, a downline terminal control feature permits any PPS/1200 system to monitor and control, independent of end transparent to a host mainframe, either a network of PPS-100 terminals or other PPS/1200 systems under IBM 3270 protocols.

Such a capability makes database and resource sharing more

flexible and more cost-effective in large data networks, the company claims.

Also, a teletype concentrator allows users with large teletype networks to consolidate message traffic on the same lines used to support PPS/1200 communications. Capitalising on its acquisition of Lextirion, Raytheon is also planning to integrate word and data processing into its multifunction terminal system in a similar manner to Four-Phase and IBM.

Raytheon is testing the attachment of Lextirion's Videotape word processing units to the PPS/1200 system as peripherals that share large, common databases.

However, the firm has not yet decided whether the system will be marketed by Raytheon, Lextirion, or both.

## FINANCIAL NEWS ROUND-UP

### UK operation sets pace for IBM global business

ALWAYS one of the last IBM companies to report its results, the UK subsidiary has just revealed that for 1978, turnover soared ahead 31% to £759 million, and net profit 22% to £78 million. The improvements were dramatically better than the company's business worldwide, where net profit rose 14.5% to \$3,111 million on turnover up

16% at \$21,076 million (CW, January 18). The UK thus contributes about 6.3% of worldwide turnover and 5% of net profit.

Exports of goods and services to other IBM companies also improved strongly, up 27% at £334 million. Shipments of the large-scale 3033 mainframe from Havant will have made a significant contribution to this

New investment in fixed assets during the year amounted to £95 million, and the workforce grew 1,100 to just under 15,000.

Manufacturing capacity at both Havant and Grantham was expanded, and construction continued on the second phase of the Warwick regional marketing centre.

### GEC 'bid' move

WEIGHING machine specialist Averys of Birmingham is still waiting for a positive bid from GEC, first mooted in December, when the electrical giant suggested it might offer 225 pence a share, and Averys rejected the offer. The possible acquisition is currently under scrutiny by the Monopolies Commission, and an indication that GEC intends to co-operate with the investigation is seen in the City as evidence that GEC is interested in going ahead with the acquisition.

### PQ price freeze

FURTHER relief for hard-pressed telecommunications users has been announced by the Post Office, which has guaranteed to freeze prices for a further nine months to the end of 1978. The corporation is also planning to raise \$250 million in the US, the reason for borrowing abroad being that interest rates are significantly lower in New York than in London. The loan will be used to pay off UK government loans, thereby saving at least £2 million a year in interest repayments.

## US firms do well

AVX CORP, a US producer of multi-layer ceramic capacitors, had sales of \$83.7 million, earning a net profit of \$4.5 million, against sales and profits for 1977 of \$44 million and \$2.8 million respectively. The company expects sales and profits to increase at annual rate of more than 30%.

SILICONIX, a US semiconductor company, increased its European sales from \$12 million in 1977 to nearly \$20 million in 1978. The aggregate 1978 sales were \$43.2 million, earning a net profit of \$3.3 million. The company is planning a major capital expenditure programme in Europe during 1979.

TERADYNE, a US manufacturer of automatic test equipment, recorded sales of \$91.7 million with profits of \$12.4 million for 1978. Sales for 1977 were \$87.8 million earning profits of \$10.3 million.



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of a new 2960 is imminent. We also have vacancies for a Data Control Clerk and a Media Librarian. Salary range £3,250-£3,450 (also under review).

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The Management Services Manager will primarily be required to establish and recommend short medium and long term strategic plans for the provision of all information and systems services within the company. The range of responsibility will encompass established O & M, Operational Research, Business Analysis and Computer departments. The successful candidate will report to the Group Financial Director and be responsible for evaluating and co-ordinating the development and implementation of new systems within agreed budgets.

The Management Services Manager will have proven management ability and a record of successful achievement in the application of both computerised and manual information systems in a commercial environment. Ideally in the age range 30-40, with a degree or professional qualification, candidates will need to have strong personnel authority and the ability to obtain acceptance and commitment to new ideas and systems.

The company's head office is located in North London from which its retail activities throughout the U.K. and Europe are controlled. Involved in its own product design and manufacture, the company has an outstanding record of successful expansion in recent years and can offer a challenging and progressive future. In addition to first-class conditions of employment the position is enhanced by the provision of a company car, P.P.P., Pension Scheme, staff discount and a commencing salary in the region of £12,000 per annum.

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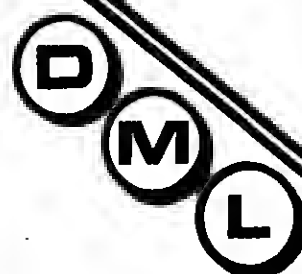
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**Reference PG16/1**

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**Reference BP 16/6**

**SYSTEMS ANALYSTS**

**City** to **£7000**  
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**West London** to **£7000 + Benefits**  
A major retail group with an expanding installation is seeking several Senior COBOL Programmers with a minimum of 3 years ICL 1900/2900 experience. Any The Company operates a retail distribution system with considerable real time involvement, thus offering the opportunity for people with solid experience to gain valuable Real-time exposure.  
They offer very good salaries with considerable benefits including staff discounts, non contributory pension and a subsidised staff restaurant.  
**Reference BP 16/8**

**JUNIOR COBOL PROGRAMMERS**

**City** to **£5000 + Mortgage**  
A major financial organisation operating a twin ICL 1900 series installation is seeking several Programmers with a minimum of just 12 MONTHS' COBOL. The Company is involved in a number of new financial systems so any experience here, although not essential, would be more than welcome.  
In return they offer very good salaries, 60p per day L.V.'s, 4 WEEKS HOLIDAY, and a 32½ HOUR WEEK, and if that is not enough then consider also their 3% MORTGAGE scheme!  
**01.439.7871** **Reference BP 16/9**

**RPG II PROGRAMMERS**

**City** to **£5500 + Mortgage**  
A large International bank urgently requires two capable RPG II Programmers to work on a whole range of financial applications on their IBM SYSTEM 34. All you will need is around 12 MONTHS' RPG II experience, on any machine, and not necessarily within the financial field.  
The appointments will offer good career opportunities and future exposure to Systems Analysis, as well as a Non-Contributory pension, Season Ticket loans and a 3% Mortgage.  
**Reference PG 16/10**

**MINI ASSEMBLER PROGRAMMERS**

**South West London** to **£7000**  
A small but rapidly expanding Software House based in London are currently seeking Assembler Programmers with a commercial background to work in a Customer Support role.  
If you have around 3 years' Assembler experience on either Mini's or Mainframes and would welcome involvement on a client contact basis then this opening should be of interest.  
The Company offers good salary plus paid overtime and the chance to move into Analysis.  
**01.439.7871** **Reference HK 16/11**

**IBM & ICL MAINFRAMES**

**IBM 370 OS** **£5000**  
Financial organisation requires Senior and Junior operators. 2 yrs experience including good JCL knowledge for the Senior post. Perks include mortgage allowance.  
**IBM 370 OS** **£4800**  
Operator with around 1 years experience required by large City company. Excellent career prospects and an unusual shift system giving plenty of free time.  
**IBM 370 DOS** **£4800**  
East London installation requires Operators with 6 months + DOS exp. Prospects of moving to programming in the future.  
**IBM 370 DOS** **£4500**  
Vacancies exist in all areas for Operators with 6 mths experience in a variety of installations offering a wide range of benefits.  
**ICL 1900** **£4300**  
City based installation requires an Operator with around 1 yrs experience. 2 shifts only plus an Annual Bonus.  
**ICL 1900** **£4500**  
Shift Leader and Senior Ops required by large 1900 site. All experience essential, knowledge of Macros useful.  
**ICE 2900** **£4400**  
Senior Op/Shift Leader for 2 shift working 2904 installation. Discount on some company products.  
**01.439.7871** **Reference MH 16/12**

Situated in N.W. Kent, and with a significant lead in the expanding Telecommunications field, our client is currently at the forefront in developing micro-processor based private telephone exchanges which will broach new ground in many areas.

## Mini/Micro Programmers £5000 to £8000

There is an immediate requirement for at least 2 Programmers to become involved in the development of the live Operational Software for this Real-Time Project.  
You should have a minimum of 12 months' experience on either mini's or micro's using either HIGH or ASSEMBLER level languages. Ideally gained within a Real-time environment.  
Although these are Operating Systems for micro-processors, much of the compiling, linking, testing and simulation will be done on IBM mainframes, thus offering a great deal of variety and interest as well as valuable exposure to a wide range of DP experience.

To find out more about these challenging and rewarding positions, call DATASCENE, and ask for PHIL GASCOIGNE.

# FORTRAN PROGRAMMER ANALYST

## Looking for a chance to get into commercial systems development?

It's not often that an opportunity arises for you to apply your FORTRAN experience in a commercial environment. But just such an occasion has arisen.

A multi-million company in the film processing business has recently installed a PRIME 400 computer with a large number of DDE screens to service their laboratories in the UK and on the Continent.

With initial mail order and sales ledger systems now complete, the company is at present setting up its own Systems and Programming Department and now requires an enthusiastic, but essentially mature minded, Programmer Analyst to head up the new team. A man or woman with at least two years' FORTRAN programming experience.

The beauty of this job is that it will be almost entirely development work, both on existing systems and on new nominal and bought ledger commercial systems, so it should provide you with plenty of interest.  
In a pleasant Thames-side Berkshire location, the company is offering a salary of up to £6500 with free BUPA, subsidised staff restaurant, Christmas bonus and annual negotiable salary review. There are other perks too and they tell us that they have a really friendly team, so don't miss this opportunity.  
Phone or write to Andy Mogg for an application form.

## up to £6500-Berkshire



Knight Computer Services Limited,  
14 Old Park Lane, London W1Y 4NL  
Staff Services Division of BOC Datasolve Group and  
a member of Computing Services Association

**01-491 4706**

**PROGRAMMERS**

A lucrative and secure future in Western Germany

**We are:** The leading bakery product manufacturer and producer in Germany and are based in Pfungstedt (between Frankfurt and Heidelberg).

**We have:** An ICL 1903 A, 96 K, 4 EOS60, 4 MT, 2 printers, document reader and plan to change to new generation equipment by the start of 1981.

**We need:** Programmer(s) who can handle ICL equipment, GEORGE TPS and COBOL and who is willing to learn German.

**We offer:** Salary of around £10,000 p.a. with excellent prospects as well as other fringe benefits. Relocation expenses are, of course, being taken care of by the company.

If you are interested please contact:

Wilhelm Weber GmbH Backwaren  
Ostendstr 8  
8102 Pfungstedt  
West Germany  
Phone number: 01048-8157-3061

Sending a CV and giving dates and/or times preferred for interview, which will take place in May 1979, in London.

### WESTFIELD COLLEGE (University of London) COMPUTER SCIENCE RESEARCH

Applications are invited from potential research students (full-time and part-time) with a good first degree in Computer Science or related subject. Research areas are Distributed Computing (Data Flow - including programming methodology, language definition and implementation), computer architecture and processor design and development.  
Write or phone (01-439-7141) for an interview to Dr. Peter Derman, Computer Science Department, Westfield College, Tottenham Avenue, London, NW2 7ET.

**£4000 - £7000 +**  
**North+Midlands**  
**Analysts & Programmers**  
**081-638-4184**  
**Sampson Staff**

### DATA PROCESSING CONTROLLER Liverpool City Centre

THE COMPANY: Established Liverpool Shipping Agents who at present have centralised accounting system based on VRC 400s will shortly be installing an NCR 5250 Computer.

THE POSITION: Data Processing Controller responsible for Accounting for overseeing implementation of established packages on an NCR 1-5250 Computer, and day-to-day control of these systems. Configuration includes 4 VDU's, 10 Mils Disc Storage and 125 LPM Printer using multiprogramming and on-line terminals. Appointment will be for about 2 years with extension on a portable at level appropriate to the position reflecting also duration of appointment.

THE CANDIDATE: The successful applicant will have had proven experience in implementing and controlling systems on a similar machine, and will be fully conversant with financial accounting principles. The position is ideally suited to an experienced Analyst or Analyst/Programmer with Computer Management experience.

Applications will be received in confidence. Please send your CV to Mr. E. D. Jones at 01-258 9871, 6 White Horse Buildings, 100, F. O. Box 22, 100 White Buildings, Water Street, Liverpool, L69 2BW.

Datascene International Ltd. Telex: 25851  
Sceptre House  
169-173 Regent Street  
London W1B 7FB **01-439 1856**

Datascene Recruitment Ltd.  
15-17 Regent Street  
London W1B 7FB **01-439 7871**



## We have moved to VICTORIA

### Central Computing Consultants

8 Lower Grosvenor Place, London SW1 Telex 27950 Ref.1035

Telephone  
**01-834 7105**

#### AMSTERDAM

##### INTERACTIVE GRAPHICS/MECHANICAL ENGINEERING DESIGN AND MANUFACTURING

The European Marketing Center of the leading International Company in COMPUTER GRAPHICS, have a requirement for an Applications Consultant and Graphics Software Specialist.

Candidates will be required (given the necessary training) to provide consultancy services on state of the art Graphics Systems and Applications, to a wide range of industries. In addition the successful candidates will be responsible for evaluation and reporting on application systems and software.

Candidates prepared to travel, will be offered high salaries plus a very lucrative profit sharing scheme and exciting long term career opportunities.  
CW16/1

#### IRELAND

Service Engineers to £7,000 basic

The Engineer Division of one of Ireland's most progressive companies is seeking additional personnel to service its rapidly expanding engineer base.

Engineers must have a minimum of 18 months' trouble-shooting computer systems (central processing disc and tape units and various electro mechanical devices) down to component level, are required for the company's Dublin office, although a certain amount of travel around the country will be necessary.

Basic salary will depend on experience, but will be very competitive and a complete package includes either a company car or allowance, full expenses and overtime payments. In addition the company offers an attractive relocation scheme.

For further details telephone Jim Corrigan on Dublin (0001) 789 577 or write to CCC at Cranmore, 65 Glen Road, Belfast BT11 8BD.

CW 16/3

#### WORK LOCALLY IN EALING & EARN £6,500 p.a.

The opportunity has arisen to join the expansion program of our clients installation located in Ealing. Two ANALYST/PROGRAMMERS with knowledge of ICL 1900 or 2803/4 hardware and software, are required to assist this company in its computerisation growth.

The immediate future involves major enhancements to both hardware and systems, including the installation of intelligent terminals at regional locations.

RPG II programming experience would be welcomed, but the successful candidates will be given full training in this skill where required.

In a nutshell, candidates living in or wishing to move to the Ealing area will benefit from job satisfaction and career growth with this expanding company, as well as a starting salary of up to £6500.

CW 16/5

#### CUSTOMER SUPPORT CONSULTANTS

£6,000 - £7,000 + Car

Our clients are Worldwide market leaders in interactive computing services who have been established for over ten years can boast an annual growth rate of over 30% during the last nine years. They have vacancies in many of their offices throughout the UK for CUSTOMER SUPPORT CONSULTANTS to help maintain this success over the next ten years.

The successful candidates will be required to provide Technical Support to existing clients, and Pre-Sales Technical Support for Salesmen, covering a wide range of applications areas and Business functions. We would like to hear from people in the 25-35 age bracket preferably with a degree or equivalent who have had some OX experience and a knowledge of one High Level language preferably FORTRAN but this is not essential.

This position will appeal to those people who feel that their present position does not give them the challenge or satisfaction they deserve.

A lot of time and money will be invested in training you for this position and in developing your career thereafter. Coupled with a policy of promotion from within, this appointment offers excellent career opportunities for those who are successful.

CW 16/7

#### SENIOR SYSTEMS ANALYST

WILTSHIRE

£7,000 + BENEFITS  
REVIEW IN JUNE

Our clients who are a major commercial organisation are expanding and diversifying their large and secure market base, and therefore require an additional SENIOR SYSTEMS ANALYST to lead projects within a young professional management team.

The successful candidate will be working with the latest Hardware (ICL) and will already have experience of Systems Analysis preferably in a Commercial environment such as Financial, Stock Control and Order Processing systems.

This position will appeal to people who wish to take the wider responsibilities towards Business Analysis.

CW 16/2

#### PROGRAMMERS & ANALYSTS

Middlesex/Hertfordshire

£6,600 p.a.

A Data Processing Department is the backbone of any successful company, especially if the company is a Multi-Million Pound Manufacturing Organisation with a turnover in excess of £1,000 million.

That is why we would like to hear from PROGRAMMERS and ANALYSTS who can become members of the team for the development of new Commercial applications.

The installation presently runs dual 1900's under G2+, but owing to the continual demand from users, one of the 1900's is shortly to be upgraded, probably by a 2880.

Programmers will need at least 18 months' experience of Cobol, Knowledge of G2+ and Datavide would be an added advantage. Analysts will need a Programming background with 18 months' Analysis experience, although Programmers who wish to advance their career into Analysis will also be considered.

The Company can offer an excellent career path through to Management, plus the usual benefits of a large company which includes Staff Shop, Sub canteen, Sports Club, Life Assurance and 4 weeks' holiday per year.

CW 16/4

#### SENIOR ANALYST PROGRAMMER

Cork

£7,500 p.a.

+ relocation exps.

A well-established Irish company wishes to appoint a Computer Professional to take charge of their new ICL installation.

The job requires someone to monitor current applications, i.e. ON-LINE ORDER ENTRY, STOCK CONTROL, etc., develop new and future systems and day-to-day running of the department.

- ★ 3 years in depth COBOL programming
- ★ 2 years' ON-LINE SYSTEMS DESIGN
- ★ Analysts and Implementation experience
- ★ Ability to manage a growing department

A rewarding career awaits the successful candidate with great future scope. An attractive salary is coupled with the type of excellent fringe benefits only associated with a major manufacturing company. Relocation expenses will be paid where appropriate.

For further details telephone Gerald Delamere on Dublin (0001) 789 577 or write to CCC at Cranmore, 65 Glen Road, Belfast BT11 8BD.

CW 16/6

#### SPRECHEN-SIE DEUTSCH

Mini/Software

up to £17,500

One of the most prestigious software companies in Europe is currently expanding their German operations in Central Germany. Their business is based on a wide range of projects currently being developed on both Minis and Business Machines.

Due to this expansion they want to meet several Computer Professionals who are competent in German, for project development. Technical background and be widespread but must include software development on minis, e.g. Siemens 330, DEC PDP11, DG Novas, etc.

While our client can accommodate people seeking employment for a year or two, they definitely want candidates with medium to long-term ideas about settling in Europe and building a future with the company.

CW 16/8

# MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

## ANALYSTS & PROGRAMMERS

### The FOCUS is on ESSEX — NOW!!

We are currently working on behalf of a selected number of prime clients in the Essex area, who are looking for experienced Analysts and Programmers.

#### SALARIES — above average

- ★ Senior Systems Analyst to £8½K
- ★ Systems Analyst c.£7K
- ★ Programmers, Cobol, RPGII or PLI to £7K

#### CAREER PROSPECTS — excellent

For an immediate interview before it's too late —  
contact me today — Val Bowen

Suite 201/6, Albany House, 324 Regent Street, London W1R 5AA. 01-637 9611

## THE BIG QUESTION

- ? Do you have expertise in MACRO, CORAL, FORTRAN, or ASSEMBLER
- ? Have you any experience of Real Time Systems
- ? Are you or could you be a Systems Designer, or Systems Engineer, or Programmer on minis and micros
- ? Have you a computing or electronic degree
- ? Are you worth between £4K and £7½K
- ? Do you want to live in a rural area of England

If you score more YES than NO  
contact Derek Pearson to evaluate your future

MANAGEMENT &  
EXECUTIVE SELECTION

## SOFTWARE PROJECT LEADER-HONG KONG

£28,400 inc.

+ £10,500 Contract Bonus 1½ yr. contract

Our Client requires a Project Leader who will work with a dedicated mini-computer system using DEC PDP11 series. Some knowledge of this equipment is essential, an in-depth knowledge a definite advantage.

Applicants should have a minimum of eight years experience in Software design and writing and be able to provide a proven record of managing the successful implementation of complex systems.

Benefits include:

- 18 months accompanied contract
- 2 months paid leave on completion
- £10,500 contract bonus
- Return airfare including family
- Settling in costs.

Applications, including a full C.V. and quoting reference 141 will be sent direct to our client. Please send a covering letter addressed to the Security Manager listing any companies to whom your application should not be passed.

**JWT Recruitment Ltd.**  
Executive Recruitment & Selection  
40 Berkeley Square London W1X 6AD 01-629 9188

**CIT SCHOOL OF ELECTRONIC SYSTEM DESIGN**  
(Approved MAPCON consultants)

**Microprocessors and their on-line application**  
Short Course  
May 21st-25th inclusive

The course (which is DOL MAP approved) covers the 8080/85/88 range of microprocessors and a number of on-line applications design techniques including discrete logic design, digital filters, Kalman filter and on-line identification. Laboratory work, with hands-on microprocessor experience, is emphasised, and comprehensive notes are provided. Write for a brochure and application form to: The Short Course Office, Cranfield Institute of Technology, Bedford, MK43 0AL, or ring John Boyle 0524 720111 Ext. 304.

**PROGRAMMERS & OPERATORS**

**FREE LIST**  
of vacancies to suit you  
**ALL AREAS**  
Please now 01-636 0171

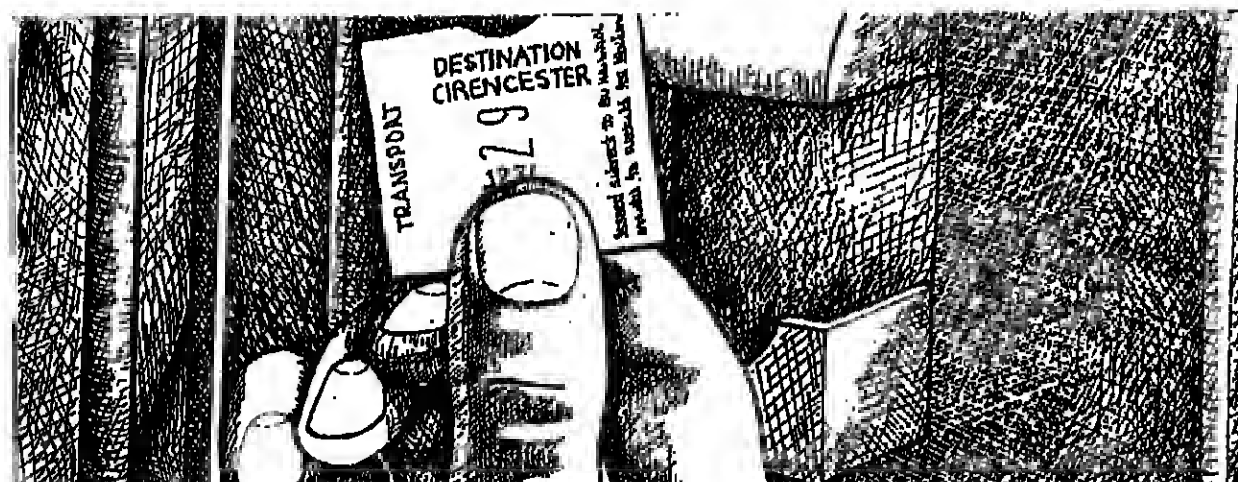
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**CLIQUE** 201 London St.  
London EC4  
Tel. 01-636 0171

**SYSTEMS SOFTWARE ENGINEER?**  
We need you for an exciting new, expanding job in  
programming.  
Apply to:  
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**PROGRAMMERS!**  
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**COMPUTER PERSONNEL APPOINTMENTS LTD.**  
Career Specialists and Consultants for  
**D.P. MANAGERS, SYSTEMS ANALYSTS,  
PROGRAMMERS AND OPERATORS**

100 Midland Avenue, Chesham, Bucks HP8 4DU  
For information forms apply to:  
65 New Street, Birmingham B2 4DU 021-644 0881  
or Tel. 01-326 7261



## PROGRAMMERS. We're issuing tickets to the top.

We're the country's leading manufacturer of fare collection systems and have a world-wide reputation to keep up. So we're not resting on our laurels.

In fact, with the vast technological resources of the EMI group behind us we're moving into completely new areas. Like the revolutionary micro-processor based ticket system we've just developed.

And we need people like you to help make the most of our plans for the future.

You'll need at least 6 years' experience of programming in Assembler or any low level language and should've worked on micro or mini-computer systems.

Depending on exactly how much experience you do have we'll offer you a salary between £4,500 and £8,500.

We're based in the pleasant market town of Cirencester, and if you have to move we'll help with the expense.

So why not contact: Mike Hopper, PER Gloucester, Grosvenor House, Station Road, Gloucester. Telephone: 0452 25525.



## MYRIAD

# RELOCATE TO THE OIL FIELDS OF KENT ASSEMBLER PROGRAMMER

LARGE COMMERCIAL PROJECT

KENT

TO £6500

This is an ideal opportunity for an Assembler Programmer to gain complete project involvement working in a small team responsible for enhancing and maintaining data processing facilities for an important area of our client's organisation.

Based in one of the most pleasant areas of rural Kent the data centre houses some of the most advanced IBM hardware together with communications equipment which links sites throughout Great Britain and Europe.

In addition to a very competitive salary the organisation is able to offer a comprehensive benefits package which includes pension and sickness scheme and flexible hours. For those wishing to move to the area there is a very generous relocation package giving 100% expenses.

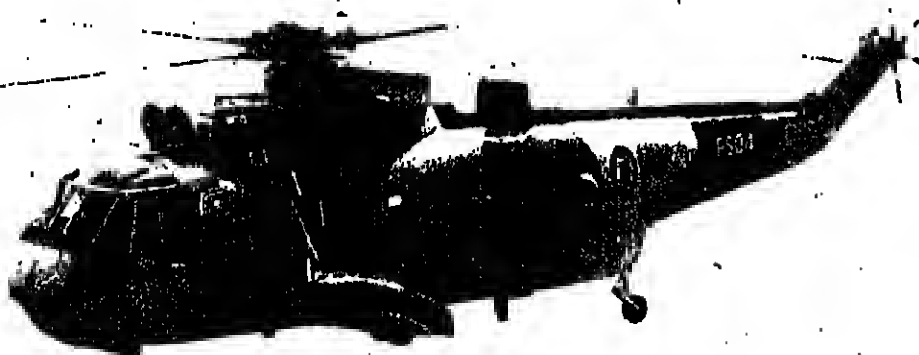
Telephone now for more detailed information regarding this position and the excellent career prospects offered.

Ref. SE1/1904

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants  
Telephone or write to:- 30 Fleet Street London EC4Y 1AA 01-353 0981 (24 hrs)

## Applications & Systems Programmers

WATFORD



### We're on the up and up - are you?

**PL1 Applications Programmers**  
Responsible for maintaining and developing suites of computer programs using online program development facilities.  
PL1 Programmers with either DOS or OS experience should apply. We would consider training you in PL1 if you have experience of DOS/VS, DLI, CICS/VS or DBOMP.

**DOS/VS Systems Programmers**  
We are looking for Systems Programmers to become responsible for a number of functions. These could include installation software maintenance; hardware evaluation; advising colleagues on new machine software; interfacing with other Rolls-Royce sites.  
Two years experience of IBM DOS/VS systems software and assembler programming is mandatory.  
Experience of CICS/VS, DLI/1 an added advantage.

**The Installation:** IBM 370/138 (mb, POWER/VS, CICS/VS, DLI/1, PANVALET, DBOMP).

Please apply with brief career details or telephone for an application form, quoting reference CW/67 to: Peter Benton, Rolls-Royce Limited, Aero Division, Leavesden, Watford WD2 7BZ. Tel: Gerston 70/35.



AERO DIVISION

### CAMDEN'S GROWING GET IN NOW!

#### Chief Executive's Department

We have an exciting new development programme and are recruiting extra staff for our 1902T installation. Fourth generation equipment is being evaluated at this moment. When in order is placed, full training will be given to all staff. At present we need:

#### SYSTEMS ANALYST

A minimum of 18 months' experience is required in systems analysis, in a commercial environment. Analysts will provide support and assistance to Project Leaders who are responsible for a team of up to seven analysts and programmers. Duties will include systems analysis and design, producing documentation to formalised standards. Salary on a scale up to £6495 p.a. (incl.) Ref. No. IC/56.

#### SENIOR PROGRAMMER

A minimum of 2 years' programming in COBOL or PL/I. Online MAXIMOP DRIVER not essential. Duties will include writing program specifications. Salary on a scale up to £5003 p.a. (incl.) Ref. No. IC/57.

#### PROGRAMMER — Career Grade

A minimum of one year's programming. Salary on a scale up to £5508 p.a. (incl.) depending on experience and ability. Ref. No. IC/58.

We are a friendly unit, working on widely varied applications, located at just about the quietest travel spot in London - King's Cross. All the generous benefits and security usually associated with local government employment including season ticket loan scheme, Maximo, etc.

For application form please telephone our 24-hour recruitment answering service 01-637 9988 or send postcard to the Chief Executive, London Borough of Camden, Town Hall, Euston Road, London NW1 2NU, stating post and appropriate reference number.

camden - an equal opportunity employer



Applicants are considered on the basis of their suitability for the post in relation to the race & ethnic origin. Also registered disabled persons with the necessary attributes are welcome to apply.

The Bibliographic Services Division of the British Library requires an

### Operations Manager

(Senior Executive Officer level)

The Bibliographic Services Division currently provides large scale on-line and batch services to its users, both from within the United Kingdom and also on an increasing scale in Europe. The processing resources for these services are provided primarily from an IBM 370/150 computer and applications are provided from persons over the age of 18, educated to 'O' level standard and who have up to one year's experience of major operating systems.

We offer: Career development opportunities; Training, including day release for computer studies; Good holiday provision - 4 weeks plus one week at Easter and Christmas; Sport/social facilities; Rural location with houses available to rent or to purchase at reasonable prices.

Application forms are available from The Recruitment Office (J0908/1), The Open University, P.O. Box 75, Watlington, Milton Keynes, MK7 8AL or telephone Milton Keynes 63404; there is a 24-hour answering service on 63668.

Closing date for applications: 4th May.

For an application form, which should be returned by May 3, 1979, please contact Mrs. L. Archer, The British Library, Personal Section, Shenton House, Great Chapel Street, London, W1. Telephone: 636 1544 ext. 518.

Applicants should have had experience of supervision in an operational environment in addition to experience in operating ICL 2903 and 1900 equipment. Previous experience of IBM 370 Operating Systems and the training of data control and operations staff would be advantageous.

Salary Scale £8,491-£7,558, including Inner London Weighting.

For an application form, which should be returned by May 3, 1979, please contact Mrs. L. Archer, The British Library, Personal Section, Shenton House, Great Chapel Street, London, W1. Telephone: 636 1544 ext. 518.

Applicants should have had experience of supervision in an operational environment in addition to experience in operating ICL 2903 and 1900 equipment. Previous experience of IBM 370 Operating Systems and the training of data control and operations staff would be advantageous.

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## TRAINING MANAGER

c. £8,000  
WEST LONDON

If your background is in lecturing or training, and you feel ready to meet the challenge of reorganising our Client's training Department in software, sales and administration, then we would like to hear from you.

Commercial software experience would be particularly useful as would experience of running a training department.

You'll join a leading mini computer manufacturer and will have ample scope to prove yourself in this demanding position.

For further details please contact MARK IRENS quoting reference CW/349/1.

HUTTON EXECUTIVE SELECTION LTD.  
HUTTON HOUSE  
HUTTON STREET, LONDON EC4Y 8HR  
TELEPHONE 01-353 7141 (24 HOURS)

**Hutton**  
SPECIALIST RECRUITMENT CONSULTANTS

## SCOTLAND

## SALES EXECUTIVE

Leading Mini Computer Manufacturer  
Commercial Systems  
Basic Salary £7,000 p.a.  
+ negotiable guarantee  
+ Company Car

This is a rare opportunity to join Our Clients, a leading Mini Computer manufacturer to manage a sales territory in Scotland.

We welcome applications from established Sales Executives from the Computer Industry who can readily identify with this growth area and have proven track records or successful sales against quota. Interviews will be held in Scotland but interested applicants should contact, in the first instance BOB BOWER, the Advising Director for further information.

Ref: CW348/2

### HERTS, BERKS, WILTS, DORSET

## SALES EXECUTIVES

Quota £13,000 p.a.  
Realistic first year's guarantee  
Plus Company Car  
Distributed Data Processing and Communications

Our Clients are a leading manufacturer of Distributed Data Processing and Communications equipment and enjoy an excellent reputation in the market place. They are looking for a Sales Executive to manage the above territories and ideally, be resident in an area where he has easy access to the whole territory.

This is a superb opportunity for someone who can readily identify with an autonomous operation and has a proven track record in selling related equipment against a pre-defined quota.

Please telephone BOB BOWER, the Advising Director for further information and to arrange a mutually convenient meeting.

Ref: CW349/3

HUTTON EXECUTIVE SELECTION LTD.  
HUTTON HOUSE  
HUTTON STREET, LONDON EC4Y 8HR  
TELEPHONE 01-353 7141 (24 HOURS)

**Hutton**  
SPECIALIST RECRUITMENT CONSULTANTS

## MADRID

## APPLICATIONS

## CONSULTANTS / SPECIALISTS

Real Time Distributed Network System

Duration: 2 years +

Remuneration: £8,000 to £13,000

plus U.K. Mortgage and Rate Subsidy

Our Client, an internationally respected systems organisation, requires Applications Consultants/Specialists who have demonstrable and sound knowledge and experience as a team or project leader with any of the following applications:

TRANSPORTATION DISTRIBUTION WAREHOUSING  
PURCHASING ACCOUNTING PERSONNEL  
EQUIPMENT, FLEET or PLANT MAINTENANCE  
SALES ORDER ENTRY AND PROCESSING  
FLEET DELIVERY SCHEDULING  
FACILITIES AND MATERIALS CONTROL  
STOCK RECORDING AND CONTROL

Applicants should have at least 4 to 6 years' systems or programming experience (preferably with small computers and COBOL) combined with the ability to effectively communicate their knowledge and skills in the local development team. Spanish language ability is not essential however you will be required to read some Spanish in the course of the work. It is desirable for all applicants to have had some foreign duty/assignment experience.

This is an opportunity to help develop one of the most advanced distributed network systems, and just think what that will do for your career when you return to the U.K.

For further details and an immediate interview, contact JIM FORTY now.

Ref: CW348-1

HUTTON EXECUTIVE SELECTION LTD.  
HUTTON HOUSE  
HUTTON STREET, LONDON EC4Y 8HR  
TELEPHONE 01-353 7141 (24 HOURS)

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## THE OPEN UNIVERSITY

## DATA PROCESSING DIVISION

## COMPUTER OPERATOR

up to £3,400

(Including an allowance for three shift working)

The University's rapidly expanding Data Centre provides support to the administrative and operational units of the University which now has approximately 70,000 home-based students. Promotions have created a vacancy for a UNIVAC 1130 Operator and applications are invited from persons over the age of 18, educated to 'O' level standard and who have up to one year's experience of major operating systems.

We offer: Career development opportunities; Training, including day release for computer studies; Good holiday provision - 4 weeks plus one week at Easter and Christmas; Sport/social facilities; Rural location with houses available to rent or to purchase at reasonable prices.

Application forms are available from The Recruitment Office (J0908/1), The Open University, P.O. Box 75, Watlington, Milton Keynes, MK7 8AL or telephone Milton Keynes 63404; there is a 24-hour answering service on 63668.

Closing date for applications: 4th May.

### ANALYST PROGRAMMER

(Ref. T.87)

AP3/5 £3,912-£5,254 inclusive

This post offers an opportunity to participate in the development of the full potential of an ICL 2903 Computer and also will be of interest to an RRG II programmer wishing to gain analysis experience.

The Computer Section is located in the Council Offices, High Street, Dartford, within easy reach of A2/M2 and Dartford British Railway Station (35 minutes London Bridge).

A generous day release/reluctation scheme is in operation. Possible assistance with housing.  
Further details and application form, returnable by 27th April 1979, are available from Personnel Section, Manor House, Swanscombe, Kent. Tel. Greenhithe (0322) 482431

**DARTFORD**  
Borough Council

## SYSTEMS ANALYSTS

Prestwich, Manchester

£4,959-£6,025

To work on a wide variety of systems, both batch and on-line.

The present installation consists of an ICL 1904S with terminals situated at remote locations. Work is already in progress in developing systems for small computers and reflects the positive attitude of the authority to new concepts and techniques. Future plans include the acquisition of a large 2900 computer in mid-1979.

Experiences in or knowledge of Communications, N.C.C. Documentation, Standards, George II Operating Systems and Programming fundamentals will be advantageous. The ability to communicate with multi-disciplinary users is essential.

Starting salary will be commensurate with experience in the range £4,959-£6,025 per annum.

The Computer Centre, which affords a pleasant working environment in new premises, is within easy access of the M26 motorway (Exit 17) and convenient for local bus and train services.

Excellent condition include staff restaurants, recreational facilities, sports and social club, a free car park, a choice of starting times and in certain cases assistance with removal expenses.

Leave entitlement consists of 20 days plus the normal statutory and other concessional holidays.

Application forms and job description, etc., may be obtained from the Regional Administrator: North Western Regional Health Authority, Gateway House, Piccadilly South, Manchester M60 7LP, telephone number 061-236 8468 Ext. 425. Closing date 19th May 1979. Please quote reference number 1 767A.

**North Western Regional Health Authority**  
Prestwich, Manchester  
COMPUTER CENTRE

### DATA TERMINAL OPERATOR - GREENWICH

Standard, Teleguide and Cable Limited have a first-rate opportunity for an intelligent man or woman, willing to work from nine to five on the system. The work involves data control at our Greenwich data processing centre. The successful candidate will be responsible for the operation of the system and will be given a generous day release from 7.30 to 4.30. Applicants aged between 25 and 40 must have a good standard of education - preferably with a degree. A good salary is offered. Working conditions and benefits are excellent. For an application form contact the Personnel Department, Standard, Teleguide and Cable Limited, Southwark Systems Division, 100 Southwark Street, London SE10 0AG. Tel. 01-858 2281 ext. 404.

### New ICL 2970 Installation— Operations

Applications are invited for experienced operations staff to join the Computer Services Division which is currently installing a 2 megabyte ICL 2970 using VME-8.

### Support Officer

Ref. CW/8/9196. Up to £4,581

Applicants should be experienced Senior Operators with at least three years' experience on large ICL mainframe equipment, preferably 2800 range. The successful candidate will demonstrate that they have the necessary operational and technical skills required for the post and will be employed on a non-shift basis as a member of a small team responsible for providing a general operating support service to the installation and its users. Responsibilities involve the setting up and control of all new systems from final stage of development to live processing, the preparation of operating procedures and customer liaison functions.

### Senior Operator/ Controller

Ref. CW/8/9197. Up to £5,130

**Inc. Shift Allowance**  
Candidates should be experienced Operators or Senior Operators with at least three years' experience on large multi-programming mainframe equipment, preferably with some supervisory responsibilities. Duties will include operating and control functions, working to pre-determined schedules, fault diagnosis, liaison with engineering and staff and the training of this personnel. A 2-shift system will be implemented.

If you are an ambitious person currently looking for career advancement in a challenging and progressive organisation, telephone 01-701 2870 any time for an application form, or write to: The Personnel Officer, London Borough of Southwark, 27 Peckham Road, London SE5 8UB, quoting the above reference and job title. Closing date 3.6.79.

**Southwark**



Recruitment



in Informatics

## U.K. Re-Insurance Group City of London

Salaries: £6.5K-£9.5K +

A leading City of London based Re-Insurance and Merchant Banking Group with a recently acquired U.S. subsidiary with extensive and soon to be upgraded computing hardware requires additional D.P. personnel up to Project Manager level. Ideally you must offer a programming background in PL-1 under OS or MVS and will either have on-line expertise or a desire to move into this area or Data-Base design through participation in our client's training programmes. Of particular importance is the

ability to work as a member of a Specialist Project team under strict documentation and programming standards. A second language — ASSEMBLER/COBOL — would in addition be of considerable advantage. Our client in addition to an excellent salary offer a reduced rate mortgage, private health and non-contributory pension schemes plus restaurant facilities. Interviews will be held on the company's premises in early May.

L10000A

## Systems Engineers Belgium

Salaries up to £15K

An internationally renowned supplier of Data Base and Teleprocessing Management Systems has requested Logistix to identify top calibre D.B. or T.P. Systems Engineers. Technically speaking you must have current experience in the implementation and support of Data-Base and/or Real-Time systems. Suitable applicants should offer IMS DB/DC exposure although due consideration will be given to those having extensive knowledge of an independent suppliers' software. You could presently be engaged in the areas of budgeting/forecasting, foreign exchange/investment or the presentation of products to both English and French speaking executives

within a seminar environment. Consequently whilst fluency in French is not a pre-requisite (since language courses can be provided at the company's expense) a certain knowledge of the language is desirable. The higher than average salaries (even for Belgium) reflect the prominence which our client places in the acquisition of these key personnel. Excellent benefits include full relocation expenses, life and disability insurance, pension/medical plans and a housing allowance. We will conduct first interviews after which candidates will spend a day with the company before offers are made.

L10000B

## Applications Support Experts Netherlands

Salaries: to £15,000

If you wish to relocate immediately to a permanent based career position in the Netherlands please read on... You should offer considerable experience in two or more of the areas outlined below. The required areas of expertise are: (a) Quality Assurance, (b) Advising development departments of software usability, (c) Pre and post sales support, (d) Problem solving on site and in-house, (e) Release preparation and (f) Evaluation of new products and techniques. In addition to above average salaries, our client will pay

full relocation expenses, assist in obtaining permanent housing (which in the case of this company is more readily available than is usual in West Netherlands) and will meet the cost of Dutch language courses for the employee and his partner. Of course, a pension plan and a health insurance scheme form an integral part of the package. There are real opportunities for transfer worldwide throughout the company's organisation.

L10000C

## Interdata Programmers West Germany

Salaries: to £15K

An international client with a long track record of successfully implementing new systems for European Public Institutions and Government Agencies is seeking several INTERDATA orientated Programmers for a long standing German project. They now require additional personnel to cope with the installation of new hardware and extended applications areas. You will become a member of one of several specialist project teams in which you will make a valuable contribution whilst simultaneously expanding your own technological frontiers. We are

specifically requested to recruit only FC/TRAN and Assembler Programmers who are fully familiar with Interdata 8/32 hardware. You should therefore offer two years or more programming experience on this machine. The applications areas in which you will be involved comprise mathematical modelling, testing, data communications and verification. On completion of the project you will be given every opportunity to relocate to one of the company's other European offices.

L10000D

## Camac Programmers Copenhagen or Holland

Salaries: to £15K

Scandinavia's leading Systems House and Software Consultancy seeks several Programmers with current expertise of software development and design on micro processors, preferably Intel 8085/6, Zilog Z80 and Motorola 6800. You will be required to

relocate immediately to one of our client's European offices. It is anticipated that employment will commence in either May or June. For further information telephone one of our Recruitment Advisers immediately.

L10000E

Logistix, Freeport 32, London W1E 3YZ

360 Oxford St.  
London W1N 9HALicenced by D.O.E.  
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01-491 4636



Telex: 28800

## SYSTEMS PROGRAMMERS for COMMUNICATIONS DEVELOPMENT

**Sia**  
COMPUTER SERVICES

£6,500-£8,500

SIA provides a nationwide technical computing service based on linked CDC Cyber 175 and 6600 mainframes backed up by a strong consulting team. Currently over 200 batch and teletype terminals are supported through Modcomp front-end processors.

The operating systems for both the CDC machines and the Modcomp mini-computers are developed and supported by SIA's System Development Team which is located at the company's headquarters in Victoria. There is an on-going programme of system development and important new projects are scheduled for the immediate future, particularly the support of new network communications protocols and European datalinks.

If you are a systems programmer with experience in telecommunications, mini-computers or CDC operating systems and would like to know more about the opportunities offered by a career at SIA, please write or telephone:

**MISS SUE KEMP, SIA LIMITED**  
23 LOWER BELGRAVE STREET  
LONDON SW1W 0NW  
01-730 4544



## OPERATORS up to £6,000

Mainframe experience?  
Used to on-line pressure?  
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We are based in W1 and run 4 dual processor 448K word DEC SYSTEM 10S — part of the largest integrated Dec installation in the world, consisting of 24 DEC SYSTEM 10S on a network of over 100 PDP 8S and 11S spread throughout the U.K.-Europe-U.S.A.

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- Income up to £6,000
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- proven upward career in operations
- free meals
- generous sickness and holiday
- contributory pension scheme (5% emp. 7% co.)
- continental 24 hour shift system
- opportunities to move into other departments

Give us a ring **Tony Harris** or **Peter Pearce** on 01-637 1355 or write (including your job history) to: **Peter Clements, ADP Network Services Ltd., 179-193 Great Portland Street, London W1N 6TB.**

UNIVERSITY COLLEGE  
CARDIFF

Applications are invited from graduates for the post of

## SYSTEMS PROGRAMMER

In the COMPUTING CENTRE, to assist in the maintenance of the system software on the current ICL 470 computer and the evaluation and introduction of a replacement machine scheduled for 1980/81. While previous System 4 experience is desirable, particular importance will be attached to an applicant's breadth of experience.

Applicants will be made on the Other Related Grades 1A £3800-£4950 p.a. or 1B £3800-£4950 (under review) according to age, qualifications and experience. Duties to commence 1st July, 1979, or as soon as possible thereafter.

Applicants (two copies), together with their CVs and addresses of two referees, should be forwarded to the Vice-Principal (Administration) and 24, Cardiff City Hall, Cardiff, CF1 1ET. Further particulars may be obtained from the Staff Officer by Wednesday 24th May, 1979.

UNIVERSITY OF SURREY  
COMPUTING UNIT

## APPLICATIONS PROGRAMMER

The University are installing a large multi-processor system during the summer and applications are invited for the post of Applications Programmer with the Computing Unit.

The successful candidate will be expected to work on the development of software for the new system.

The salary will be on the scale £3800-£4950 p.a.

Further particulars can be obtained from the Staff Officer, University of Surrey, Guildford, GU10 3XH. Telephone GUILDFORD 2525. Applications in the form of a curriculum vitae with names and addresses of two referees should be sent to the Staff Officer by Wednesday 24th May, 1979.

## MYRIAD

## ANALYST/ PROGRAMMER

IN LINE FOR SYSTEM 38

W. LONDON

TO £8000

An attractive opportunity has now arisen for an additional analyst/programmer to join our client who is currently planning for the introduction of an IBM System 38 into the installation.

The person appointed can look forward to developing systems with a high degree of self-motivation, from feasibility through to implementation. On-line systems are of great importance and present development plans include an extension of these facilities.

The successful applicant will be able to offer a sound RPGII/CCP commercial programming background, preferably obtained in an IBM System 3/15D environment, coupled with the ability to work with new techniques and make a strong contribution to the development effort.

Our client is a very successful manufacturing and marketing company in a major international group. In addition to a competitive starting salary they offer a subsidised canteen facility and a highly favourable discount on company products as part of a comprehensive benefits package.

Ref. NW1/1904

MYRIAD APPOINTMENTS LIMITED

30 Fleet Street London EC4Y 1AA

01-353 0981 (24 HOURS)

UNIVERSITY OF HONG KONG  
SENIOR COMPUTER

OFFICER I/II

Applications are invited for two posts of Senior Computer Officer I/II in the University Computer Centre. One of the appointments is in the area of academic user services. The successful candidate will be responsible for the development and maintenance of the Centre's computer facilities, and to provide consultancy and support to academic staff members and students. Applicants should have a minimum of three years of experience in system development work in a university or other education/research institution.

The second appointment is for support of the University's administrative applications. In analysis and implementation of new systems and in review and conversion of existing systems. Applicants should have a minimum of three years of experience in system development work in a university or other education/research institution. Preference will be given to persons with experience in on-line applications.

Annual salaries (supplementary) will be: Senior Computer Officer I: HK\$98,700 + 4,280 + 120,000; Senior Computer Officer II: HK\$78,320 + 4,280 + 105,140. (E = HK\$110.00 approx.)

At current rates, salaries will not exceed 15% of gross income. Housing allowances, long leave and medical benefits are provided.

Further particulars and application forms may be obtained from the Association of Commonwealth Universities (Acus), 38 Gordon Square, London WC1H 0PF, or the Assistant Secretary (Personnel), University of Hong Kong, Hong Kong.

Closing date for applications is 31st May, 1979.

## SOUTHERN SUNSHINE!

Systems Consultant (Bureau) £7,500 +  
As/Prog. (Bureau/2nd) £7,500  
Systems Analyst (Bureau/2nd) £7,500  
As/Prog. (Manufacturing) £7,500  
Senior Programmer (Bureau) £7,500  
Prog/Analyst £7,500 + Bonus  
Systems Programmer £7,500

These are but a few of the 100+ vacancies we are currently seeking to fill.

SOB WILLIAMS KNOWS THE SOUTHERN MARKET and can be relied upon to arrange relevant and interesting interviews. Telephone today for a free interview.

**Minimisation Personnel**  
2 Lutetia Guildford Surrey  
GUILDFORD (0438) 6666

## Is your computing career at a standstill? Co-op Bank offer you six good reasons for a change —

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At our new purpose-built computer complex we need experienced and ambitious men and women to work with the major IBM 3031 mainframes, developing our new nationwide network, based on 3800 series terminal systems.

We shall be using DL1 database and CICS. We see here an excellent opportunity for programmers and analysts to broaden their scope within a fast growing banking organisation.

**Senior Systems Analysts—up to £6,696—**

to undertake major analysis and design work related to the new systems. You should have a number of years experience of analysing and designing applications for IBM 370/3030 systems.

**Systems Analysts—up to £5,676—**

working in teams with the Senior Analysts.

**Senior Programmers—up to £5,335—**

who have several years experience in the use of IBM installations using COBOL and ASSEMBLER.

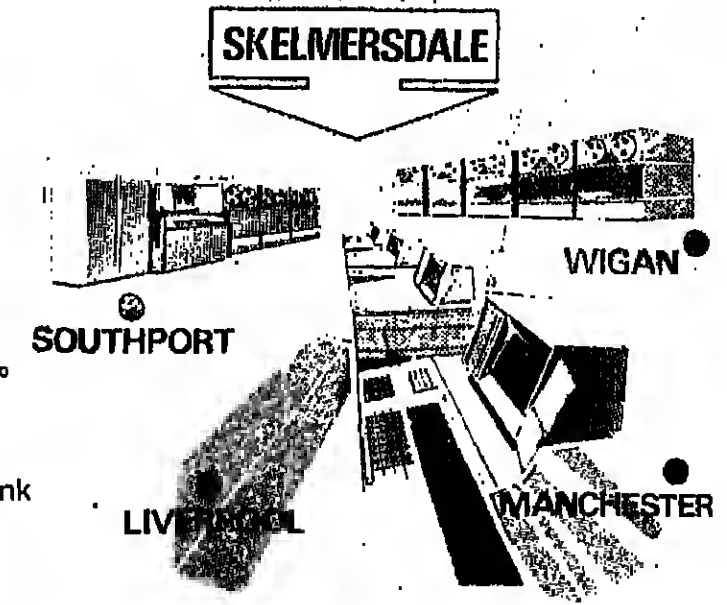
Our new complex is located at Skelmersdale in the heart of Lancashire. Reasonably priced and attractive housing is readily available, offering the beautiful Lancashire coast or the rural areas north of Manchester and Liverpool as new places to settle down. The new railway network and modern roads make travel easy. The neighbouring towns and two major cities offer entertainment of such a variety as to please all tastes.

Salary offers will be based upon age, experience and will offer the full range of banking benefits.

For further information about our future and your advanced computerised banking, please write with full details to: J. Gwyn, Personnel Manager, Co-operative Bank Limited, P.O. Box 101, Wigan, Greater Manchester, M16 9LR.

P.S. If you are interested but your qualifications or experience do not quite match, we would still be interested in hearing from you, as we also have vacancies below these senior levels.

The Co-operative Bank



## OPERATORS

**ICL 1900** to £5000  
Site in SW London & Essex require Senior Operators with 2 yrs O/E exp. 2 Shifts only.

**ICL 1900** c. £3500  
Company in Essex requires an operator with 9 mths' exp. in O/E Manual Operating. Good career prospects for the right person. 2 Shifts only.

**UNIVAC** £4200  
Installation in W. London is looking for an Operator with 18 mths' + 1108 exp. Prospects of travel for right person.

**HONEYWELL** £4000  
Operations with some exp. in GCOS are required for this site in W. London.

**NCR** £4000  
Company in Essex are looking for an operator with 9 mths' Century/Criterion exp. Own transport is a requirement for this position.

**IBM OS** £6300  
Are you a S/Leader with 3 yrs' supervisory exp. and feel you have senior management potential? Then this leading company in Central London is for you!

**IBM OS** £5600  
4 yrs' experience reqd. plus 1 yr. as a S/Leader for exp. in Central London & Surrey.

**IBM OS** £4600  
Operations with 9 mths' exp. required by companies in Essex, Wiltshire & Central London.

**IBM DDS** £5000  
Senior Operators with 2 yrs' exp. required by 3 companies in East London. 3 mths' experience a only part of the total package available.

**IBM DDS** £4600  
Maintenance of 3 mths' exp. reqd. by this Company in C. London. Excellent career prospects for the right person.

**TARGA COMPUTER SERVICES**  
3 LIVERPOOL STREET  
LONDON EC2M 7NH 01-283 2751



# We're successful because our staff are

Data Logic operates at the forefront of computing, applying the very latest hardware and techniques to practical commercial problems. We cover the range from mainframes to the smallest computers. We are leaders in the use of microprocessors for applications that not so long ago required far larger machines. Several of our projects involve dispersed networks of ten or more minicomputers.

The exceptional scope of work is important to our staff. We can match their individual experience to their projects. Equally, we can ensure that each project adds to their experience. As

computing itself develops, so do they.

Over the past year Data Logic has grown dramatically in size, in scope of work and in reputation. Our expansion has meant unrivalled opportunities for career progression. We are not prepared to promote people before they are ready for it. But when they are ready — and we give all the assistance we can — the positions as senior programmer, senior analyst, project manager and consultant will be there waiting for them.

The reason is simple. We know that we are successful only if our staff are.

## Senior Software Staff

(Ref PS101)

For mainframe, minicomputer and mixed processor systems, usually supporting terminal networks. Increasingly Data Logic's turnkey projects involve minicomputers at multiple sites.

Applicants must have at least five years experience including some work in consultancy, system design or team management. Substantial knowledge is required of either high level language implementation on a leading mainframe or assembler language development on DEC, Data General or other leading minicomputers. We are especially interested in experience of:

- database systems
- distributed systems
- data communications
- telemetry
- operating systems design and implementation

Salaries will be up to £8,500, with a car allowance or company car for those at the top end of the scale.

There are vacancies at our Greenford, Birmingham and Manchester offices.

## Programmers

(Ref PS/02)

For both mainframe and minicomputer projects which include commercial applications, monitoring and control, and scientific analysis.

Applicants should have at least three years programming and/or analysis experience in high-level language or assembler on any leading mainframe or mini. Salaries will be in the range of £4,500 to £6,500.

Vacancies exist in our Greenford, Birmingham and Manchester offices.

## Data Communications Support Engineers

(Ref CP101)

For sales and engineering support roles within Communications Products Division which markets the INTERTEL range of modems and Network Control Systems.

Applicants should have experience either in sales support for data equipment or in design for digital and analogue systems. A degree or HNC qualification is desirable.

Base location will be in Central London but high mobility will be essential and a car will be provided. Salaries will be in the region of £6,500.

## Systems Support Staff

(Ref CE/4)

For specialist support roles within our Customer Engineering Division, which provides nationwide field service for terminal and distributed systems, word processors and data communications equipment. The support staff deal with hardware and software, within a diversity of user environments. Each product represents the state-of-the-art in its area.

Applicants should have a degree in electronic engineering or computing science, followed by at least three years work in specialist support with a mainframe manufacturer.

Base location will be Harlow, Essex but high mobility is essential and a car will be provided.

## Programmers

(Ref TS/03)

To work on systems software, emulators and advanced packages for applications such as data entry, for Data Logic's PFS100 range of terminal and distributed systems. This is an outstanding opportunity to gain experience in the development of complex high performance standard software. Programmers will work in small teams, taking considerable responsibility for distinct functional areas of the total system.

Applicants should have one to three years experience of software implementation in high-level or assembler languages. A degree in computing science is desirable.

Location will be Harlow, Essex and salaries will be in the range of £4,500 to £6,500.

# Data Logic

Write or call, quoting the appropriate reference:  
Kathy Martin, Data Logic Limited, 29 Marylebone Road, London NW1.  
Telephone 01-486 7288.

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## CONSULTANT

quota £10K +

You probably have a successful background in permanent recruitment, your present income is around the £6000-£8000 bracket and you are hungry for more money BUT most of all you are frustrated by the limitations of your current position — in other words you need —

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then we may have just what you are looking for!

Now that we have established a successful Permanent Division, we require someone who can take over this Division and expand it and, ultimately, taking full managerial responsibility (and the perks that go with it).

**IF YOU'VE GOT WHAT IT TAKES**  
Telephone us now in strictest confidence

**HEXAGON**  
Computer Services

145 WARDOUR STREET, LONDON W1V 3TB

TEL 01-439 3671

## ICL Computer Operators

Enfield

£3,700-£5,700

(including shift allowance)

\* ICL 1900's

\* IBM 360

\* ICL 2900's

\* Communications

For operators with ICL experience, this is a chance to widen your skills in a whole range of hardware and software. We have the equipment, the training commitment and the opportunities to increase your experience significantly.

Our existing installation in Enfield comprises an ICL 2972/MEB system due for enhancement to a dual 2972, three large ICL 1900 mainframes and an IBM 360 system. The installation lies at the centre of an extensive communications network covering East Anglia.

As we expand our operations to cover the transfer from 1900 to 2900 work we will require more operators; preference will be given to trained operators with a minimum of two years experience on ICL 1900 systems.

The salary will depend on your experience and will be within the range of £3,700-£5,000 p.a. plus 17% shift allowance on basic pay. Benefits include subsidised restaurant, 4 weeks holiday p.a., pension and sickness schemes, sports and social facilities etc.

These positions are open to both male and female applicants.

Application forms can be obtained from:

The Personnel Officer,  
Eastern Gas, Tower Point,  
Sydney Road, Enfield,  
Middlesex.  
Tel: 01-366 1234  
ext. 227 or 402.

**EASTERN GAS**

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For the best permanent jobs

Eg.	IBM	DOS/VS	2 x OPS	ELDN	£8000
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	ICL	2904	SNR OP	DAYS	£8800
	IBM	OS/VS	2 x OPS	WLDN	£9000

**COMPUVAC**

253/5042

**DATA CONTROLLERS!**  
ALL LEVELS  
PERMANENT

**PROGRAMMERS ANALYSTS**  
PERMANENT  
ALL LEVELS

## Systems Analyst

Between £5,517 and £5,853 (inclusive) to start

The Computer Section is responsible for developing and maintaining a wide variety of systems on the Council's ICL 1902T installation with communications equipment. This vacancy has arisen through internal promotion.

### WE WANT

- \* A Systems Analyst, who has designed and implemented at least one major system.
- \* Experiences of 1900 software.

### WE PREFER

- \* Professionally qualified candidates with Local Government experience.

### WE OFFER

- \* A starting salary between £5,517 and £5,853 on a scale rising to £5,345 (inclusive).
- \* Annual leave entitlement 22 days plus one extra day's leave each month.
- \* Pension scheme and subsidised staff restaurant.
- \* Systems work in an interesting variety of applications.

Please contact John Allcock, Borough Treasurer's Department, 22-28 Clements Road, Ilford IG1 1BD, telephone 01-478 3020, extension 309, for an application form.

**Redbridge**  
London Borough

IMPERIAL COLLEGE OF SCIENCE  
AND TECHNOLOGY  
DEPARTMENT OF MANAGEMENT  
SCIENCE

**ASSISTANT TO THE  
COMPUTER  
MANAGER**

Applications are invited for the above post. The person appointed should be able to carry out a variety of duties under the general guidance of the Department's Computer Manager. The successful candidate will be responsible for the day-to-day running of the computer system and will be expected to take part in the development of new systems. The successful candidate will be expected to take part in the development of new systems. The successful candidate will be expected to take part in the development of new systems.

UNIVERSITY OF GLASGOW  
DEPARTMENT OF ELECTRONICS  
AND ELECTRICAL ENGINEERING

**PROGRAMMER  
FOR S.R.C.  
MINI-COMPUTER**

The S.R.C. will shortly install a DEC470 mini-computer in the Department of Electronics and Electrical Engineering. The successful candidate will be responsible for the day-to-day running of the computer system and will be expected to take part in the development of new systems. The successful candidate will be expected to take part in the development of new systems.

## THE SALES AND MARKETING BIT

### TERRITORY MANAGEMENT—1

## The Journey Planning System

A SALESMAN who is out of touch with the people supporting him is likely to be out of touch with sales success.

Ask any sales secretary how she makes contact with salesmen whenever urgent situations arise. Her answer is almost sure to be "With considerable difficulty".

Yet it is absolutely essential that rapid communication with the salesman is achievable at all times if the immediate reaction that problems and opportunities usually demand, is to be put into effect.

Many salesmen operate like undercover agents, surreptitiously creeping from one clandestine meeting to another, as if they were peddling heroin rather than selling data processing products, breaking cover only to collect their expenses and attend the monthly Mafia meeting.

It is undeniable that where there is mystery concerning the activity of salesmen there is also inefficiency. People seldom hide those facets of their nature which might increase their esteem among their fellows.

So, when a salesman cannot be found it could mean that he is disorganised, dishonest, lazy, inefficient, certainly not management material and possibly looking for a new job. However, the most likely failing, is the lack of an effective journey planning system.

A journey planning system is simply a device which helps the salesman to construct a logical sequence of sales calls for the week(s) ahead and takes into account such factors as geography, call frequency, client category, and special situations and priorities. It is a system which tells the salesman and his supporting colleagues who? When? Where? Why? at a single glance. It is an essential device in terms of both efficiency and discipline.

A single form is all that is required to create a controlled situation for both sales calls and salesman/office communications. The essential elements are obvious: Time/Day; Company; Name of Contact; Telephone No; Purpose of Call; Appointment or Cold Call; Overnight address and Telephone No.

A copy of the completed form to interested parties is all that is needed. The making of appointments, it is important that a journey planning system is accompanied by efficient, geographically oriented client records in order to facilitate, both efficient routing and the possibility of unscheduled, speculative calls on existing and prospective clients in the same locality. (This would normally exclude first-time calls.)

### New branch

The Data Communications Division of Harris Systems has opened a new South of England branch office at Bards House, Cambridge Grove, 31 Manor Road, London W8. Tel: 01-741 0001.

It is preferable that the journey plan be generated 2/3 weeks in advance of intended calling as opposed to the usual one week. Most people manage to keep their diaries full at least one week ahead, so a two-week lead-time tends to generate less "busy signals" and is more likely to avoid the pressure of "squeezed-in" appointments.

One good discipline when making appointments, which usually generates at least a couple of extra sales calls a week, is to arrange the first and last appointment for each day before those in the middle.

Another factor to consider is the best time of the week to perform this administrative function of appointment making. Most salesmen leave this task for Monday mornings and Friday afternoons. If that is the case, maybe those times would be less competitive for actually making calls and the middle of the week better for administrative activity?

Just a thought!

TRADER

## PRODUCT NOTES

### Digital locking system

A DIGITAL combination system, specially designed for computer suites, banks and other high security areas, has been introduced by the Baron Security Group.

The Digital Combination System eliminates the use of keys for mechanical locks and enables authorised personnel to change the operating code at will. On pressing the correct code, the door unlocks immediately.

The control unit is housed in a lockable steel box, and an enable facility warns of intruders pushing numbers on the keyboard. It is priced at £163 plus VAT.

The Baron Security Group (CW), 52 Monmouth Street, London WC2H 9EP. Tel: 01-836 6128.

### Colour prints for 35p

GETTING hard copy output from a Viewdata terminal is still difficult, particularly in colour, but Graphic Display Systems of Cambridge sells a polaroid camera with a five-inch lens for £188 and a hood to position it in front of a 20-inch screen for £35, which will then give colour prints for 35 pence each.

Although there are cheaper polaroid cameras available, GDS managing director John Davidson says that a five-inch lens is necessary to enable freedom from distortion.

### Puzzle Answer

288 x 2 = 576  
576, 140 x 6 = 8,420, 840.



## SARAH COVENTRY LIMITED ANALYST/ PROGRAMMER

The Company has been established in the United Kingdom for some fifteen years and is a subsidiary of one of the leading jewellery direct selling companies in America.

An opportunity has arisen for an analyst/programmer to take the responsibility of the present computer department.

The primary job will be to examine and make proposals for an upgraded system from the present ICL 1901 A. This will involve preparing project drafts and agreeing specifications with the relevant user departments before planning, writing, testing and documenting programs.

This important task will be in addition to maintaining current systems and supervising the present computer operating staff.

The person will require technical drive and enthusiasm, will have a minimum of 2 years' experience of COBOL and have been educated to 'H' or 'A' grade.

An attractive salary is offered and the Company has a contributory pension scheme. Housing is readily available in the area which is a pleasant and agreeable part of the country.

Apply, giving full details of experience to:

Personnel Manager  
Sarah Coventry Limited  
Eastfield Industrial Estate  
GLENROTHES, Fife KY7 4NR

## Computer Programmer

AP2/4

Total salary in the range £3,912-£4,812

This Council operates an I.B.M. System 3 Model 12 with 3340 Disk Drives and a 3411 Tape Drive which provides a comprehensive and increasing range of user services.

Applications are invited for this new post from programmers with two years' RPGII experience to join our team at the Council's Knowle Green Offices, Staines, Middx.

Application forms and further details are available from the Personnel Office

Council Offices, Knowle Green, Staines

Middx. TW18 1XS

Tel: Staines 61488, Ext. 280

Closing date: 4th May 1979

Spelthorne

## FORTRAN

### ENGINEERING SCIENTIFIC BACKGROUND

CONTACT US, THE SPECIALISTS IN THESE FIELDS

We urgently require Programmers with experience of Fortran, Assembler, Cobol or Basic for Real-time Applications.

Jobs from £3,500 to £8,000 in all areas. Phone now for a free list of vacancies.

Capital Appointments, 25 Windmill Street, London, W1

Telephone: 01-337 5551 (day) - 01-337 5559 (even.)

# Operations Vacancies VICTORIA, LONDON

Phillips Petroleum Company has continued to be in the forefront of North Sea Oil and Gas development. Our computer installation, situated close to Victoria Station, is based on an IBM 3031 processor under OS/VS1 with plans to install a second IBM 3031 and migrate to MVS/JES 3 during 1980. A large teleprocessing network is an integral part of the system serving both local and remote users around the globe. The developments within this sphere of activities have necessitated the acquisition of highly motivated DP professionals to fill the following vacancies.

### CHIEF OPERATOR (Ref. DPO/479/001)

To supervise the day-to-day running of the central computer installation providing a reliable and totally available system (24 hours/365 days/year). The successful candidate will be responsible also for recruitment and training of operating personnel, the writing and maintenance of standards, the production of monthly reports and liaison with users and manufacturers. Current staff level reporting to the Chief Operator is 15.

You should have a minimum of five years' DP experience of which three years will have been at supervisory level in an operations environment, a thorough understanding of IBM hardware/software, experience of teleprocessing networks and a proven record of project coordination and management reporting.

### SHIFT LEADER (Ref. DPO/479/002)

We require an experienced supervisor to run our computer facilities on a shift basis. The successful candidate should have at least five years' experience on IBM 370/303X under OS and good understanding of IBM software/hardware. Telecommunications experience would be an advantage. A 12-hour shift system is in operation with at least one week in five working normal office hours. Shift allowance and time off is generous.

### TELECOMMUNICATIONS NETWORK CONTROLLER

(Ref. DPO/479/003)

A newly created position reflecting the increasing importance of the teleprocessing aspects of the company's business. The Network Controller will be totally responsible for the day-to-day running of the teleprocessing systems from an operational viewpoint. Including liaison with users, the systems software and telecommunications groups, and the collection and analysis of statistical information. You will also be involved with identifying and analysing VDU and line problems, making any necessary arrangements for alternative facilities and organising back-up and recovery procedures to ensure speedy systems restoration.

We are looking for someone with at least four years' operations experience, some of which will have been spent controlling a telecommunications network. A comprehensive knowledge of telecommunications theory and facilities is essential.

### OPERATIONS SUPPORT ANALYST (Ref. DPO/479/004)

We are interested in people experienced in the control and maintenance of program and procedure libraries, the ability to write production JCL for business applications, and on application of data security methods. You will be involved in the analysis of our current production systems and recommending and implementing changes to improve reliability and operating efficiency, the writing of JCL for new applications, and the testing of new or amended systems prior to handover to the production control group.

A thorough knowledge IBM JCL and utilities and a knowledge of business systems and analysis techniques is required for this position. Telecommunications experience would be an advantage. This position carries a shift allowance.

If you are interested in a challenging career in a fast moving industry — with salary and benefits to match the experience, skill and effort which these jobs demand — then please write or telephone for an application form.

B. Sutherland, Placement and Training Unit, Phillips Petroleum Company Europe-Africa, Portland House, Stag Place, London SW1E 5DA. Tel. No. 01-828 8788. 24-hour answering/recording service on 01-828 2893.

Phillips Petroleum Company  
The Performance Company



TEESIDE POLYTECHNIC  
DEPARTMENT OF  
MECHANICAL  
ENGINEERING  
RESEARCH  
ASSISTANTSHIP:  
AUTOMATION OF  
SMALL BATCH  
PROCESSING

Applications are invited for an LEA Research Assistantship to work on the Automation of Small Batch Processing. The aim of the project is to apply microprocessor technology to bring computer-aided manufacturing techniques within the range of small firms. The post is for up to three years at a salary of £2,583-£2,774 and involves up to six hours' teaching per week, without additional payment. Registration for a CMAA highest degree is expected. Candidates should have or expect to get a degree in a discipline involving computer science; computer technology; or control engineering with some computer content. Application forms and further particulars are available from the Staffing Section, Teesside Polytechnic, Borough Road, Middlesbrough, Cleveland TS1 2BA, and are available within 14 days of the appearance of this advertisement.

LONDON SCHOOLS OF  
SERIALS AND  
JOINT COMPUTERS INSTALLATION

### SHIFT LEADER

(Salary £4,510-£4,822 p.a., inc.)

requires to head the team operating our IBM 370/145 installation.

Applicants should have a good working knowledge of OS or OS/VS coupled with the ability to communicate effectively, and to solve operational problems.

The section works on a two shift basis, and the successful candidate (male/female) will take on the overall level of responsibility for the efficient running of the installation.

Application forms from Personnel Office, Room A202, Town Hall, Avenue, Tel. 01-337 237, Tel. 01-337 2424 ext. 3380. Closing date 4/5/79. Please quote ref. no. 277 DC.

### JUNIOR PROGRAMMERS

ANY LANGUAGE!

CVAS 254 1979

### CITY OF BIRMINGHAM EDUCATION DEPT.

St. Philip's R.C. Sixth Form College

Hagley Road, Edgbaston B15 2UP

Required September

Graduate to teach

CHEMISTRY

to Advanced Level and able to assist in teaching of BIOLOGY. Scale 1. Post would suit student completing his/her professional studies this June.

Applications (by letter in first instance) including curriculum vitae and the names and addresses of two referees, should be sent to the Principal to whom copies should be sent for assistance with interview.

### South East Thames Regional Health Authority

Senior Software Programmer

Salary Scale 14, £5,851 (including London Weighting)

New post to develop software and programs for distributed processing.

Application Form and more information from Administration Department, South East Thames R.H.A., Regional Computer Centre, Baker Drive, London SE11 4TH. 01-337 0071 (ext. 401).

### MAGAZINE TECHNICAL EDITOR

Technical Editor needed for new monthly (London-based) computer magazine — previous publishing experience a help, though not essential. Applicants should have a thorough and wide ranging knowledge of present day computer technology and its applications. Salary is negotiable.

Also, freelance writers required for the same project.

Write to: Service Recruiters, 14 Rotherhithe Place, London E14 3JH. Tel. 01-337 7791.

### OPPORTUNITY KNOCKS...

### PROGRAMMERS

HENRI HEMPSTEAD

Marvellous opportunity to join a small team and be in at the ground floor of a new computer system — a Division of Ode Efficiency Ltd. — that they want to market turnkey systems on Micro Computer Systems.

We urgently need professional, ambitious, competent programmers to help build more standard business packages and special application programs. You will be working to tight schedule and sound commercial application experience is essential.

Realise your ambitions through working with Microcomputer Systems — a fast growing business. Contact Chris Murphy or David James on 0442 46161 NOW.

Or call/write to them at: MICROSENS COMPUTERS

Flower Road, Hemel Hempstead, Herts HX3 7JL

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Our client, a major United Kingdom name with head office in West Yorkshire wishes to recruit a Data Processing Manager.

This is a key position, reporting directly to the Finance Director, carrying responsibility for a department of 90 people and hardware currently installed worth in the order of £1 million. Current and planned developments involve new systems throughout all the main operational areas of the company and will employ on-line processing and database techniques.

Successful candidates, preferably graduates or professionally qualified, aged mid to late 30's must have extensive data processing experience in a commercial environment. A record of success in implementing major new systems and managerial achievement in data processing are essential requirements for this demanding and challenging position.

An attractive remuneration package will be negotiated including salary from £10,000 plus car, free BUPA, relocation expenses where appropriate and other fringe benefits normally associated with a senior management appointment in a major company.

Applicants should contact Ivor Norton with full career details quoting reference CW/79019 in order to arrange an initial confidential discussion.

# Sales Professional

- \* Location Manchester
- \* Established Territory
- \* Number of Established Users
- \* Enhancement Business

## Realistic Earnings £14,500 to £16,500

This is a unique opportunity to join a market leader in distributive processing systems who are currently enjoying considerable success with advanced products in the local government sector. This particular vacancy is the result of promotion reflecting considerable well qualified sales potential.

You can expect a high proportion of enhancement business enabling you to meet the realistic quotas combined with excellent software support that will ensure further market penetration. You will need a proven track record in the systems bureau or terminal

sales area with the enthusiasm and maturity to handle this senior post. Previous experience of local government would be an added advantage, (but is not essential).

### THE REWARDS

Basic salary to £7,000 on quota earnings £14,500 to £16,500 and a flexible attitude towards first year guarantees. Other benefits will include company car or car allowance, excellent training and an organisational structure offering real career prospects.

For further details contact: DAVID WADE ON 061-833 0427 OR 0785 56013 (outside office hours).



Specialist Computer Recruitment Ltd.

London 01-337 0871 33 Mandeville Place, Wigmore Street, London W1M 6LB  
Birmingham 021-238 9781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY  
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061-833 0427